

**General Instructions:**

- (i) Question paper comprises five Sections – A, B, C, D and E. There are 34 questions in the question paper. All questions are compulsory.
- (ii) Section A – Question 1 to 21 is MCQs of 1 mark each.
- (iii) Section B – Question no. 22 to 27 are Short Answer Type Questions, carrying 3 marks each
- (iv) Section C - Question no 28 to 30 are Long Answer Type Questions, carrying 8 marks each. Answer to each question should not exceed 300-350 words
- (v) Section D – Question no.31 to 33 are Source based questions with three sub questions and are of 4 marks each
- (vi) Section-E - Question no. 34 is Map based, carrying 5 marks that includes the identification and location of significant test items. Attach the map with the answer book.
- (vii) There is no overall choice in the question paper. However, an internal choice has been provided in few questions. Only one of the choices in such questions has to be attempted.
- (viii) In addition to this, separate instructions are given with each section and question, wherever necessary.

**SECTION A**

**MCQS 1X21=21**

**1. Who began working on the critical edition of the Mahabharata?**

- A. V.S. Suthankar
- B. R.D Banerjee.
- C. Alexander Cunningham
- D. Daya Ram Sahni

**2. What do you understand by the term “Benami”?**

- A. Transactions made in the name of a fictitious person.
- B. Transaction made in a name of a genuine person.
- C. Legal transactions.
- D. Only transactions related to land.

**3. Which of the following statements is correct about Kabir?**

- A. Kabir’s verses are compiled in ‘Kabir Bijak’ only.
- B. Kabir was and is a source of inspiration to many.
- C. He advocated only Saguna Bhakti
- D. Kabir believed in polytheism.

**4. Identify the given image from the following options:**



- A. Sculpture of a Gupta king
- B. Sculpture of a Maurya king
- C. Sculpture of a Kushana king
- D. Sculpture of a Chola king

**5. \_\_\_\_\_ wrote Mrichchakatika.**

- A. Shudraka.
- B. Aryabhata.
- C. Chanakya.
- D. Mrichchhela.

**6. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R).**

**Assertion (A): Gandhiji started the Salt Satyagraha in the year 1930.**

**Reason (R): Salt was unreasonably taxed by the British officials which put an economic burden on the common people.**

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true but R is not correct explanation of A.
- C. A is correct but R is not correct.
- D. R is correct but A is not correct.

7. Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R).

**Assertion (A):** The Harappan settlements were abandoned after some time.

**Reason (R):** There have been evidences of large scale burning at some sites.

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true but R is not correct explanation of A.
- C. A is correct but R is not correct.
- D. R is correct but A is not correct.

8. When was the city of Vijaynagara founded?

- A. 1336.
- B. 1565.
- C. 1800.
- D. 1498.

9. Who was the political Guru of Mahatma Gandhi?

- A. M.G.Ranade.
- B. Gopal Krishna Gokhale.
- C. Bal Gangadhar Tilak.
- D. Jyotiba Phule

10. From the given pairs, which one is NOT correctly matched?

- A. Andal:Alvar
- B. Karaikkal Ammaiyar : Nayanar.
- C. Shaikh Nizamuddin Auliya : Sufi.
- D. Kabir : Lingyat.

11. \_\_\_\_\_ is the practice of a woman having several husbands.

- A. Polygamy.
- B. Polyandry.
- C. Matrilineal.
- D. Endogamy.

12. What was Damin-i-Koh?

- A. Demarcated land under the authority of the British.
- B. Demarcated land under the authority of the Santhals.
- C. Demarcated land under the authority of the Oraons.
- D. Demarcated land under the authority of the Collector

13. Who among the following was sent by the ruler of Persia to Calicut?

- A. Colin Mackenzie.
- B. Alexander Cunnigham.
- C. John Marshall.
- D. Abdur Razzaq.

14. Which of these conferences was held in November, 1930?

- A. First Round Table Conference.
- B. Second Round Table Conference.
- C. Third Round Table Conference.
- D. Fourth Round Table Conference.

15. Read the following statements and identify the character of Mahabharata.

I. She declared her love for Bhima.

II. She told Kunti that she liked her tiger like son.

III. She gave birth to a Rakshas boy.

- A. Draupadi.
- B. Gandhari.
- C. Hidimba.
- D. Subhadra

16. Which of the following books was written by Chanakya?

- A. Patanjali.
- B. Arthashastra.
- C. Harshacharita.
- D. Rajtarangini.

17. Which of the following townships was founded by Krishnadeva Raya near Vijaynagara?

- A. Nagapattanam.
- B. Naglapuram.
- C. Raichur.
- D. Kannanur Kupam.

18. Queen Prabhavati Gupta belonged to which of the following dynasties?

- A. Chauhan Dynasty.
- B. Chalukyan Dynasty.
- C. Vkataka Dynasty.
- D. Pallava Dynasty.

19. The first gold coins were issued by?

- A. Kushanas.
- B. Mauryans.
- C. Guptas.
- D. None of the above.

20. Which of these items were not found in the graves of the Harappans?

- A. Jewellery.
- B. Copper mirrors.
- C. Pottery.
- D. Books

21. Who was the President of the Constituent Assembly?

- A. Jawaharlal Nehru.
- B. Rajendra Prasad.
- C. B.R Ambedkar.
- D. Tej Sapru.

## SECTION B

### SHORT ANSWER TYPE QUESTIONS 3X6=18

22. "There are limits to what epigraphy can reveal". Justify with suitable arguments.

23. Examine the causes that made Al-Biruni visit in India.

24. Explain any three features of Harappan drainage system.

OR

Describe any three sources to know about Harappan civilization.

25. Explain why the Revolt of 1857 became an expression of popular resistance in Awadh than anywhere else to the British Rule

OR

“Art and literature helped in keeping alive the memory of 1857”. Explain with examples from Indian perspective.

26. Describe the features of water resources of Vijaynagar Empire.

27. Explain the impact of American Civil War of 1861 on Indian peasants

### SECTION C

#### LONG ANSWER TYPE QUESTIONS 8X3=24

28. Explain the importance of Non- Cooperation Movement.

OR

Explain the significance of Civil disobedience Movement.

29. Explain the role of Panchayats in the Mughal Rural Indian Society during 16th-17th centuries

OR

“Revenue was the economic mainstay of the Mughal Empire”. Explain the statement in the context of agriculture and trade

30. Explain the language and content of Mahabharata.

OR

Explain how you will prove that the text of Mahabharata was a dynamic one.

### SECTION D

#### SOURCE BASED QUESTIONS 3x4=12

#### 31. The One Lord:

Here is a composition attributed to Kabir: Tell me, brother, how can there be

No one lord of the world but two?

Who led you so astray?

God is called by many names :

Names like Allah, Ram, Karim,

Keshav, Hari, and Hazrat.

Gold may be shaped into rings and bangles. Isn't it gold all the same?

Distinctions are only words

we invent ...

Kabir says they are both mistaken.

Neither can find the only

Ram. One kills the goat, the other cows,

They waste their lives in disputation.

31.1 According to Kabir, how many lords of the world are there? By which names do

we call them? From where has these names been taken? 1

31.2 Write any two other teachings of Kabir. 1

31.3. According to Kabir, why cannot both the Hindus and the Muslims attain God? 2

#### 32. “British element is gone but they have left the mischief behind”

Sardar Vallabh Bhai Patel said

It is no use saying that we ask for separate electorates, because it is good for us.

We have heard it long enough. We have heard it for years, and as a result of this agitation we are now a separate nation... Can you show me one free country where there are separate electorates? If so, I shall be prepared to accept it. But in this unfortunate country if this separate electorate is going to be persisted in, even after the division of the country, woe betide the country; it is not worth living in. Therefore, I say, it is not for my good alone, it is for your own good that I say it, forget the past.

One day, we may be united... The British element is gone, but they have left the mischief behind. We do not want to perpetuate that mischief. (Hear, hear).

When the British introduced this element they had not expected that they have to go so soon. They wanted it for their easy administration. That is all right. But they have left the legacy behind. Are we to get out of it or not?

32.1 Why are separate electorates considered as a mischief? 1

32.2 State any one argument given by Sardar Vallabh Bhai Patel for building political unity and forging a nation. 1

32.3. Mention the reasons behind Sardar Patel urging the assembly members to get rid of separate electorate. 2

#### 33. Why were Stupas Built?

This is an excerpt from the Mahaparinibbana Sutta, part of the Sutta Pitaka. As the Buddha lay, dying Ananda asked him “What are we to do Lord, with the remains of the Tathagata (another name for the Buddha)?” The Buddha replied, “Hinder not yourselves Ananda by honouring the remains of the Tathagata. Be zealous, be intent on your own good.”

But when pressed further, the Buddha said, “At the four crossroads, they should erect a thupa (Pali for stupa) to the Tathagata. And whosoever shall there place garlands or perfume.... or make a salutation there, or become in its presence calm of heart, that shall long be to them for a profit and joy.”

33.1 Why were the stupas built? 1

33.2 What did Ashoka do with the relics of Buddha? 1

33.3 Describe the structure of stupas. 2

**SECTION E**

**MAP BASED QUESTIONS 1x5=5**

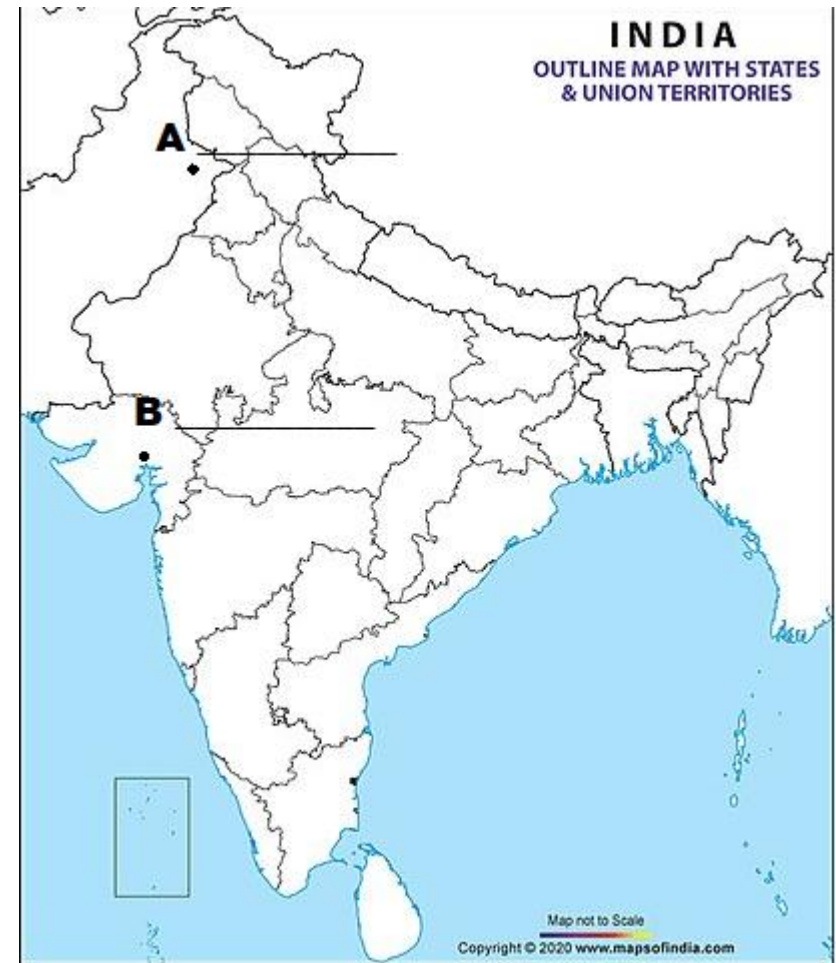
**34.**  
**(34.1) On the given political map of India, locate and label the following with appropriate symbols.**

- I. Amritsar- an important centre of National Movement.
- II. Chauri Chaura- the place where Mahatma Gandhi called off the Non – Cooperation Movement.
- III. Vijaynagara- City ruled by Tuluva dynasty.

**OR**

Agra- A territory ruled by Babur.

**(34.2) On the same outline map , two places have been marked as A and B, as mature Indus valley sites. Identify them and write their correct names on the lines drawn near them.**



**General instructions:**

1 This question paper contains two parts:

Part A – Macro economics (40 marks)

Part B – Indian Economic Development (40 marks)

2 Marks for questions are indicated against each question.

3 This paper contains 20 Multiple Choice Questions type questions of 1 mark each.

4 This paper contains 4 Short Answer Questions type questions of 3 marks each to be answered in 60 to 80 words,

5 This paper contains 6 Short Answer Question type questions of 4 marks each to be answered in 80 to 100 words.

6 This paper contains 4 long Answer Questions type questions of 6 marks each to be answered in 100 to 150 words.

**PART A (MACRO ECONOMICS)**

1] If the value of Average Propensity to Save (APS) is 0.2 and national income is Rs 4,000 crore, then consumption will be \_\_\_\_\_.

- a] Rs 4000 crore
- b] Rs 3,200 crore
- c] Rs 3,800 crore
- d] Rs 2,600 crore

2] BoP accounts show \_\_\_\_\_.

- a] The export import status of the foreign country
- b] The performance of domestic economy in relation to the rest of the world
- c] Growth potential of the foreign economy
- d] All of these

3] Read the following statements carefully:

Statement 1: Credit creation is an important function of the central bank.

Statement 2: Commercial banks regulate the supply of money in the economy.

In the light of the given statements, choose the correct alternative:

- a] Statement 1 is true and statement 2 is false
  - b] Statement 1 is false and statement 2 is true
  - c] Both statements 1 and 2 are true
  - d] Both statement 1 and 2 are false
- 4] Dividends received from Public Sector Undertakings (PSUs) are a part of the government's \_\_\_\_\_.

- a] Non-tax revenue receipts
- b] tax receipts
- c] Capital receipts
- d] Capital expenditure

5] Read the following statements carefully:

Statement 1: Sale and purchase of second hand goods is not included in the estimation of GDP.

Statement 2: Rise in national income always leads to a rise in per capita income.

In the light of the given statements, choose the correct alternative:

- a] Statement 1 is true and statement 2 is false
- b] Statement 1 is false and statement 2 is true
- c] Both statements 1 and 2 are true
- d] Both statement 1 and 2 are false

**OR**

Wages and salaries in cash + Payment in kind + Employer's contribution in social security scheme + \_\_\_\_\_ = Compensation of employees

Choose the correct alternative to be filled in given blank.

- a] Old-age pension
- b] Retirement pension
- c] Employees contribution to social security
- d] None of these

6] Suppose in a hypothetical economy, the income rises from Rs 5000 crore to Rs 6000 crore. As a result, the consumption expenditure rises from Rs 4000 crore to Rs 4,600 crore. Marginal Propensity to Consume is such a case would be \_\_\_\_\_.

- a] 0.8
- b] 0.4
- c] 0.2
- d] 0.6



13] Give the meaning of 'average propensity to save' and 'marginal propensity to save'. How are they calculated? 4

14] Decrease in availability of credit helps in controlling the situation of excess demand in an economy. Why? 4

15] Read the following passage carefully and answer the questions on the basis of the same.

Commercial banks are essentially dealers in credit. Interest is the price that guides them in making business decision. They were initially started as institutions for meeting the short term credit requirements of trade industry and commerce and it remains their primary function even today. In view of that requirement, the legal framework never put restrictions on the credit creations power of these banks. However, legislation did require the central bank of each country to oversee. Credit must not be confused with money. Their nature and role in an economy differ. Credit is a liability of the borrowing public but an asset of the banks. The public keeps part of their cash holdings as demand deposits in the banks. Banks help multiply cash deposits manifolds through their credit creation activities.

Do you consider a commercial bank 'creator of money' in the economy? 4

**OR**

In the present scenario when the industrial growth is low, do you think a cut in repo rate by the RBI would accelerate the pace of industrial growth?

16] a] Distinguish between real flow and money flow. 3

b] Distinguish between intermediate goods and final goods. 3

17 a] All machines are capital goods. Defend or refute. 2

b] Will the following factor income be included in domestic factor income of India? Give reasons for your answer. 4

i] Payment of fees to a chartered accountant by a firm.

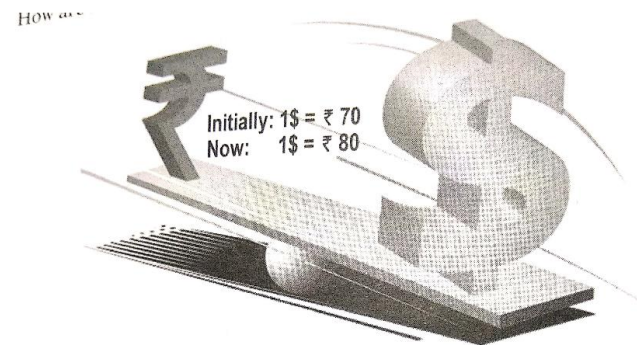
ii] Rent received by an Indian resident from Russian embassy in India.

iii] Compensation given by insurance company to an injured worker.

iv] Compensation of employees to the resident of Japan working in Indian embassy in Japan.

**OR**

a] Analyse the image given below and state its impact on import and exports of India.



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b] State four sources each of revenue receipts and capital receipts in a government budget.

18] Choose the correct pair of alternatives given in column A with those in column B.

1

|     | Column A      |   | Column B                      |
|-----|---------------|---|-------------------------------|
| i   | Cash crops    | a | industrialisation             |
| ii  | IMR           |   | Occupational structure        |
| iii | Capital goods |   | Demographic condition         |
| iv  | R. C. Desai   |   | Estimation of national income |

Options:

a] i – a          b] ii – b          c] iii – c          d] iv – d

19] Fill in the blanks: 1

Two well managed Iron and steel companies were situated in \_\_\_\_\_ and \_\_\_\_\_ at the time of independence.

a] Durgapur and Jamshedpur

b] Jamshedpur and Calcutta

c] Bhilai and Jamshedpur

d] Durgapur and Calcutta

20] Read the following statements – Assertion (A) and Reason (R). Choose one of the correct alternatives given below: 1

**Assertion (A)** – In spite of being the world's most populous country, China's annual growth rate of population (0.46) is lower than India's growth rate of population (1.03) and Pakistan's annual growth rate of population (2.05).

**Reason (R)** – The one child policy was part of a birth planning program designed to control the size on the rapidly growing population of the People's Republic of China.

**Alternatives:**

a Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).

c Assertion (A) is true but Reason(R) is false

d Assertion (A) is false but Reason (R) is true.

21] Read the following statements carefully:

Statement 1 – Diversification in agriculture activities means finding alternative employment in non-farm sectors.

Statement 2 – Policy instruments initiated by government to improve agricultural marketing in India is Minimum Support Price.

In the light of the given statements, choose the correct alternative: 1

a] Statement 1 is true and statement 2 is false

b] Statement 1 is false and statement 2 is true

c] Both statements 1 and 2 are true

d] Both statement 1 and 2 are false

22] Read the following statements carefully:

Statement 1 – First five year plan of China commenced in the year 1956.

Statement 2 – Reforms in Pakistan were introduced in 1978.

In the light of the given statements, choose the correct alternative: 1

a] Statement 1 is true and statement 2 is false

b] Statement 1 is false and statement 2 is true

c] Both statements 1 and 2 are true

d] Both statement 1 and 2 are false

23] Formation of human capital is a \_\_\_\_\_ process. 1

a] Technical b] Political

c] Social d] Economical

24] Significance of human capital was recognized in \_\_\_\_\_ five year plan. 1

a] third b] Second c] Seventh d] Fourth

25] \_\_\_\_\_ is the total planetary inheritance and the totality of all resources. 1

a] air pollution b] Sustainable development

c] Ozone layer d] Environment

26] Read the following statements – Assertion (A) and Reason (R). Choose one of the correct alternatives given below: 1

**Assertion (A)** - Jobless growth refers to a situation when the economy is able to produce more goods and services without corresponding increase in the level of employment. India is experiencing the phenomenon of jobless growth.

**Reason (R)** – During the period of 1950- 2010 GDP of India grew positively and was higher than the employment growth. During this period employment grew at the rate of not more than 2%. During these years we also find a widening gap between the growth of GDP and employment.

**Alternatives:**

a Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).

c Assertion (A) is true but Reason(R) is false

d Assertion (A) is false but Reason (R) is true.

27] 'The objective of WTO is to establish a rule based regime.' True or False? Give reasons. 1

**OR**

Demonetisation does not target

a] Tax administration

b] Cash less economy

c] Credit creation

d] Encouragement of black money



28] Interpret the given picture on account of how conventional sources of energy is harmful for our environment and what is the way ahead? 3



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29] Why is the percentage of female workers low and lower still in urban areas? 3

**OR**

What were the shortcomings of the Green Revolution in Indian agriculture?

30] Group the following features pertaining to the economies of India, China and Pakistan under three heads: 4

One child norm, Low fertility rate, High degree of urbanization, Mixed economy, very high fertility rate, large population, High density of population, Growth due to manufacturing sector, Growth due to service sector.

**OR**

Analyse the recent trends in sectoral distribution of workforce in India.

Trends in Employment Pattern (sector- wise), 1993-2012 (in %)

| Sector    | 1993-94 | 1999-2000 | 2011-2012 |
|-----------|---------|-----------|-----------|
| Primary   | 64      | 60.4      | 48.9      |
| Secondary | 16      | 15.8      | 24.3      |
| Services  | 20      | 23.8      | 26.8      |

31] India is often called the 'outsourcing destination' of the world. Discuss the prime reasons for this name given to India. 4

32] Explain how investment in Human capital contributes to growth of an economy. 4

33] We cannot look at the environment and rural development as two distinct subjects. We need to develop eco-friendly technologies that lead to sustainable development so that productive sustainable livelihood may be provided to the rural people. For example, organic farming helps in sustainable development in agriculture.

There is need to invent alternate sets of eco-friendly technologies that lead to sustainable development in different circumstances. Out of these sets, each rural community can choose whatever will suits its purpose.

Read the above passage carefully and answer the following:

- a] Give two examples of alternate marketing channels. 2
- b] What is operation flood? 2
- c] What is the benefit of organic agriculture? 2

**OR**

- a] What do you mean by agricultural marketing? 2
- b] Mention some obstacles that hinder the mechanism of agricultural marketing. 4

34] a] Though public sector is very essential for industries, many public sector undertakings incur huge losses and are a drain on the economy's resources. Discuss the usefulness of public sector undertakings in the light of this fact. 3

b] How did the British intend to use export surplus from Indian economy? 3

General Instructions :

1. This Question paper contains - **five sections** A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
2. **Section A** has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
3. **Section B** has **5 Very Short Answer (VSA)-type** questions of 2 marks each.
4. **Section C** has **6 Short Answer (SA)-type** questions of 3 marks each.
5. **Section D** has **4 Long Answer (LA)-type** questions of 5 marks each.
6. **Section E** has 3 **source based/case based/passage based/integrated units of assessment** (4 marks each) with sub parts.

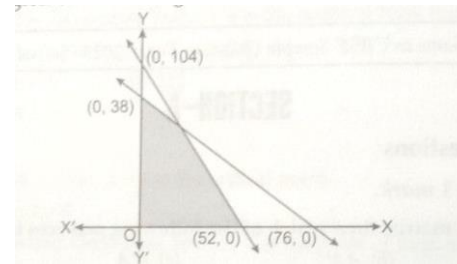
**SECTION-A**

**Multiple Choice Questions (Each question carries 1 mark.)**

1. If A is a square matrix, then which of the following matrices is not symmetric?  
(a)  $A + A'$  (b)  $AA'$  (c)  $A'A$  (d) NONE
2. Given that A is a square matrix of order 3 and  $|A| = -4$ , then  $|\text{adj } A|$  is equal to  
(a) -4 (b) 4 (c) -16 (d) NONE
3. The vector  $\vec{r}$  of magnitude  $3\sqrt{2}$  units which makes an angle of  $\frac{\pi}{4}$  and  $\frac{\pi}{2}$  with y and z-axis, respectively is  
(a)  $\vec{r} = \pm 4\hat{i} - 5\hat{j}$  (b)  $\vec{r} = \pm 3\hat{i} + 3\hat{j}$   
(c)  $\vec{r} = \pm 5\hat{i} + 5\hat{j}$  (d) NONE
4. If  $f(x)$  is everywhere differentiable, then the values of a and b if  
 $f(x) = \begin{cases} x^2 + 3x + a, & \text{for } x \leq 1 \\ bx + 2, & \text{for } x > 1 \end{cases}$  is  
(a)  $a=3, b=5$  (b)  $a=0, b=5$   
(c)  $a=0, b=3$  (d) NONE
5. If  $f(x) = e^{ax}$ , then  $f(x)$  is  
(a)  $ae^{ax}$  (b)  $e^{ax} + C$  (c)  $e^{ax}$  (d) NONE

6. The number of solutions of the system of inequations  $x + 2y \leq 3, 3x + 4y \geq 12, x \geq 0, y \geq 1$  is  
(a) 0 (b) 2 (c) finite (d) NONE
7. Area of a rectangle having vertices A, B, C and D with position vectors  $-\hat{i} + \frac{1}{2}\hat{j} + 4\hat{k}, \hat{i} + \frac{1}{2}\hat{j} + 4\hat{k}, \hat{i} - \frac{1}{2}\hat{j} + 4\hat{k}$  and  $-\hat{i} - \frac{1}{2}\hat{j} + 4\hat{k}$  respectively is  
(a)  $\frac{1}{2}$  (b) 1 (c) 2 (d) NONE
8.  $\int_0^{\frac{2}{3}} \frac{dx}{4+9x^2}$  is equal to  
(a)  $\frac{\pi}{6}$  (b)  $\frac{\pi}{12}$  (c)  $\frac{\pi}{24}$  (d) NONE
9. The integrating factor of differential equation  $(1 - x^2) \frac{dy}{dx} - xy = 1$  is  
(a)  $-x$  (b)  $\frac{x}{1+x^2}$  (c)  $\sqrt{1-x^2}$  (d) NONE
10. if  $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 59 & 69 & -1 \end{bmatrix}$  then  $A^{-1}$   
(a) is A (b) is  $-A$  (c) is  $A^2$  (d) dose not exist

11. The region of an LPP is given in the following figure:



Then, the constraints of the LPP are  $x \geq 0, y \geq 0$  and  
(a)  $2x + y \leq 52$  and  $x + 2y \leq 76$  (b)  $2x + y \leq 104$  and  $x + 2y \leq 76$   
(c)  $x + 2y \leq 104$  and  $2x + y \leq 76$  (d) NONE

12. The determinant  $\begin{vmatrix} y+k & y & y \\ y & y+k & y \\ y & y & y+k \end{vmatrix}$  is equal to  
(a)  $k(3y + k^2)$  (b)  $3y + k^3$  (c)  $3y + k^2$  (d) NONE
13. If  $\begin{vmatrix} 5 & 3 & -1 \\ -7 & x & -3 \\ 9 & 6 & -2 \end{vmatrix} = 0$  then the value of x is  
(a) 3 (b) 5 (c) 7 (d) NONE

14. 10% of the bulbs produced in a factory are of red colour and 2% are red and defective. If one bulb is picked up at random, the probability of its being defective, if it is red is

- (a)  $\frac{1}{7}$  (b)  $\frac{20}{27}$  (c)  $\frac{1}{5}$  (d)  $\frac{2}{5}$

15. The general solution of  $\frac{dy}{dx} + y \tan x = \sec x$  is

- (a)  $y \sec x = \tan x + C$  (b)  $y \tan x = \sec x + C$   
 (c)  $\tan x = y \tan x + C$  (d) NONE

16. If  $y = 2^x$  then  $\frac{d^2y}{dx^2}$  is equal to

- (a)  $2^x(\log_e 2)^2$  (b)  $2^x \log_e 2$   
 (c)  $2^x$  (d) NONE

17. If  $|\vec{a}| = 8$ ,  $|\vec{b}| = 3$  and  $|\vec{a} * \vec{b}| = 12$ , then the value of  $\vec{a} \cdot \vec{b}$  is

- (a)  $\sqrt{3}$  (b)  $12\sqrt{3}$  (c)  $6\sqrt{3}$  (d) NONE

18. If the line makes an angle of  $\frac{\pi}{4}$  with each of y and z axes, then the angle which it makes with x - axis is

- (a) 0 (b)  $\pi$  (c)  $\frac{\pi}{2}$  (d) NONE

### Assertion-Reason Based Questions

In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.  
 (b) Both A and R are true but R is not the correct explanation of A.  
 (c) A is true but R is false.  
 (d) A is false but R is true.

19. Assertion (A): A function  $f: R \rightarrow R$  given by  $f(x) = \cos x$  is a bijection.

Reason (R): A function  $g: A \rightarrow B$  is a bijection then  
 $\exists$  a function  $h: B \rightarrow A$  such that  
 $goh = I_B$ , and  $hog = I_A$

20. Assertion (A): The distance between the points (1, 0, 0) and (0, 0, 0) is 1.

Reason (R): Distance between two points  $P(x_1, y_1, z_1)$  and  $Q(x_2, y_2, z_2)$  is

$$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

### SECTION-B

(This section comprises of very short answer type questions (VSA) of 2 marks each.)

21. Find the principal values of  $\tan^{-1}(-\sqrt{3})$ .

OR

Check injectivity and surjectivity of  $f: Z \rightarrow Z$  given by  $f(x) = x^2$ .

22. Find the values of x for which  $y = [x(x - 2)]^2$  is an increasing function.

23. If  $\vec{a}$  and  $\vec{b}$  are two vectors such that  $|\vec{a} + \vec{b}| = |\vec{b}|$ , then prove that  $(\vec{a} + 2\vec{b})$  is perpendicular to a.

OR

Show that the line through the points (4,7,8), (2, 3, 4) is parallel to line through the points (-1,-2, 1), (1, 2, 5).

24. If  $y = (\cos x)^{(\cos x)^{(\cos x)^{\dots\infty}}}$  then show that  $\frac{dy}{dx} = \frac{y^2 \tan x}{y \log \cos x - 1}$

25. If  $\vec{a}$  and  $\vec{b}$  are two unit vector and  $\theta$  is the angle between them, then prove that  $\sin \frac{\theta}{2} = \frac{1}{2} |\vec{a} - \vec{b}|$ .

### SECTION-C

(This section comprises of short answer type questions (SA) of 3 marks each)

26. Find:  $\int \sin^{-1} \sqrt{\frac{x}{a+x}} dx$

27. The random variable X can take only the values 0, 1, 2, 3. Given that  $P(X = 0) = P(X = 1) = p$  and  $P(X = 2) = P(X = 3) = a$  such that  $\sum p_i x_i^2 = 2 \sum p_i x_i$ , find the value of p.

OR

Four bad oranges are accidentally mixed with 16 good ones. Find the probability distribution of the number of bad oranges when two oranges are drawn at random from this lot. Find the mean of the distribution.

28. Evaluate:  $\int_1^3 \frac{\sqrt{x}}{\sqrt{x} + \sqrt{4-x}} dx$

OR

Evaluate:  $\int_{-1}^3 |x^3 - 3x^2 + 2x| dx$

29. Find the general solution of the following differential equation:  $x \frac{dy}{dx} = y - x \sin\left(\frac{y}{x}\right)$

OR

Find the particular solution of the following differential equation, given that  $y=0$

$$\text{when } x = \frac{\pi}{4}; \frac{dy}{dx} + y \cot x = \frac{2}{1 + \sin x}$$

30. Maximize:  $Z = 100x + 120y$

Subject to the constraints:  $2x + 3y \leq 30, 3x + y \leq 17, x, y \geq 0$ .

31. Find  $\int [\log(\log x) + \frac{1}{(\log x)^2}] dx$

### SECTION-D

(This section comprises of long answer type questions (LA) of 5 marks each)

32. Using integration, find the area of the region in the first quadrant enclosed by the line  $x + y = 2$ , the parabola  $y^2 = x$  and the  $x$ -axis.

OR

Using integration, find the area of the region  $\{(x, y): 0 \leq y \leq \sqrt{3x}, x^2 + y^2 \leq 4\}$

33. Find the equation of the line which intersects the lines  $\frac{x+2}{1} = \frac{y-3}{2} = \frac{z+1}{4}$  and  $\frac{x-1}{1} = \frac{y-2}{3} = \frac{z-3}{4}$  and passes through the point  $(1, 1, 1)$ .

34. Let  $A = [x \in Z : 0 \leq x \leq 12]$ . Show that  $R = \{(a, b): a, b \in A, |a - b| \text{ is divisible by } 4\}$  is an equivalence relation. Find the set of all elements related to 1. Also write the equivalence class  $[1]$ .

35. If  $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 3 \\ 1 & -2 & 1 \end{bmatrix}$  find  $A^{-1}$ . Hence, solve the following system of equations:  $x + y + z = 6, y + 3z = 11$  and  $x - 2y + z = 0$ .

OR

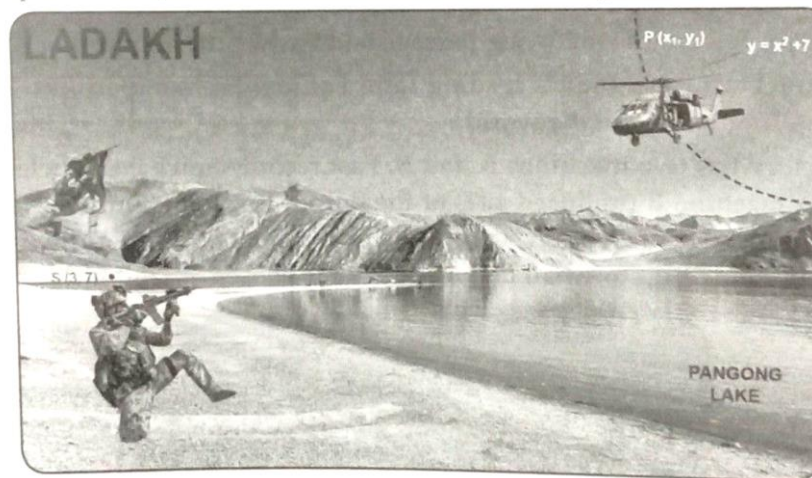
If  $A = \begin{bmatrix} \cos \alpha & -\sin \alpha & 0 \\ \sin \alpha & \cos \alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$ , find  $\text{Adj } A$  and verify that  $A(\text{adj } A) = (\text{adj } A)A = [A]I_3$

### SECTION-E

(This section comprises of 3 case-study/passage-based questions of 4 marks each. First two case study questions have three sub-parts (i), (ii), (iii) of marks 1, 1, 2 respectively. The third case study question has two sub-parts of 2 marks each.)

36. Case-Study 1: Read the following passage and answer the questions given below.

These days Chinese and Indian troops are engaged in aggressive melee, face-offs skirmishes at locations near the disputed Pangong Lake in Ladakh. One day a helicopter of enemy is flying along the curve represented by  $y = x^2 + 7$ . A soldier placed at  $(3, 7)$  wants to shoot down the helicopter when it is nearest to him.



(i) If  $(x_1, y_1)$  represents the position of the helicopter on the curve  $y = x^2 + 7$ , when the distance (D) from soldier at S  $(3, 7)$  is minimum. Find the relation between  $x_1, y_1$

(ii) Express the distance (D) as a function of  $x_1$ , (D is in (i)).

(iii) Find the interval in which the function D is strictly Increasing/strictly decreasing.

OR

For the function D find the point of local minima and local minimum value of D.

37. Case-Study 2: Read the following passage and answer the questions given below. Given a rectangular park of perimeter 32 m.

en a rectangular park



- (i) If length is  $x$  cm, breadth is  $y$  m then express the area function ( $A$ ) in terms of  $x$
- (ii) Find the critical point for  $A$ .
- (iii) Use first derivative test to find the length and breadth of the park that maximize the area.

OR

If the rate of change in length  $x$  is 3 m/min and that of breadth  $y$  in 2 m/min. Find the rate of change in Area when  $x = 10$  m,  $y = 6$  m.

38. Case-Study 3: Read the following passage and answer the questions given below. Mahindra Tractors is India's leading farm equipment manufacturer. It is the largest tractor selling factory in the world.

This factory has two machines A and B. Past record shows that machine A produced 60% and machine B produced 40% of the output (tractors). Further 2% of the tractors produced by machine A and 1% produced by machine B were defective. All the tractors are put into one big store hall and one tractor is chosen at random.



om choosing chosen tractor

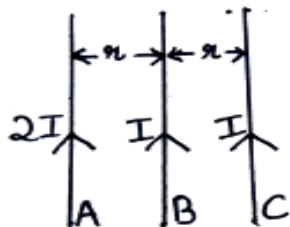
- (i) If in random choosing, chosen tractor is defective, what is the probability that the chosen tractor is produced by machine "A"?
- (ii) If in random choosing, chosen tractor is defective, what is the probability that the chosen tractor is produced by machine 'B'?

**General Instructions:**

- (1) There are 35 questions in all. All questions are compulsory
- (2) This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.
- (3) Section A contains eighteen MCQ of 1 mark each, Section B contains seven questions of two marks each, Section C contains five questions of three marks each, section D contains three long questions of five marks each and Section E contains two case study based questions of 4 marks each.
- (4) There is no overall choice. However, an internal choice has been provided in section B, C, D and E. You have to attempt only one of the choices in such questions.
- (5). Use of calculators is not allowed.

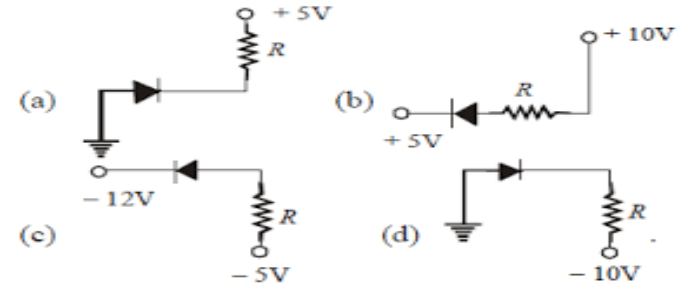
**SECTION A**

1. A negatively charged object X is repelled by another charged object Y. However an object Z is attracted to object Y. Which of the following is the most possibility for the object Z?
  - (a) positively charged only
  - (b) negatively charged only
  - (c) neutral or positively charged
  - (d) neutral or negatively charged
2. An electric dipole consisting of charges  $+q$  and  $-q$  separated by a distance  $L$  is in stable equilibrium in a uniform electric field  $\vec{E}$ . The electrostatic potential energy of the dipole is
  - (a)  $qLE$
  - (b) zero
  - (c)  $-qLE$
  - (d)  $-2qLE$
3. By increasing the temperature, the specific resistance of a conductor and a semiconductor
  - (a) Increases for both
  - (b) decreases for both
  - (c) Increases for conductor and decreases for semiconductor
  - (d) Decreases for conductor and increases for semiconductor
4. Two wires of same length are shaped into a square of side 'a' and a circle with radius 'r'. If they carry same current, the ratio of their magnetic moment is
  - (a)  $2 : \pi$
  - (b)  $\pi : 2$
  - (c)  $\pi : 4$
  - (d)  $4 : \pi$
5. Three infinitely long parallel straight current carrying wires A, B and C are kept at equal distance from each other as shown in the figure. The wire C experiences net force  $F$ . The net force on wire C, when the current in wire A is reversed will be



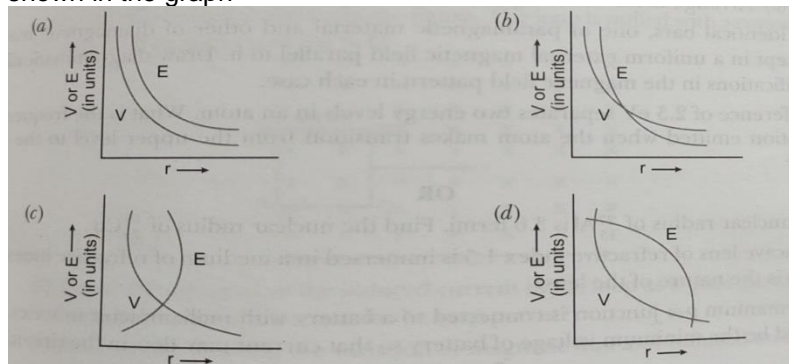
- (a) zero    (b)  $F/2$     (c)  $F$     (d)  $2F$

6. Uniform electric and magnetic fields are produced pointing in the same direction. An electron is projected pointing in the same direction, then
  - (a) the velocity of the electron decreases
  - (b) the velocity of the electron increases
  - (c) the electron turns left
  - (d) the electron turns right
7. An alternating voltage source of variable angular frequency ' $\omega$ ' and fixed amplitude ' $V$ ' is connected in series with a capacitance  $C$  and electric bulb of resistance  $R$  (inductance zero). When ' $\omega$ ' is increased
  - (a) glows less brightly
  - (b) glows more brightly
  - (c) glows with same brightness
  - (d) total impedance of the circuit increases
8. During the propagation of electromagnetic waves in a medium
  - (a) electric energy density is double of the magnetic energy density
  - (b) electric energy density is half of the magnetic energy density
  - (c) electric energy density is equal to the magnetic energy density
  - (d) both electric and magnetic energy densities are zero
9. In electromagnetic induction, the induced e.m.f. is independent of
  - (a) time
  - (b) change in flux
  - (c) number of turns in coil
  - (d) resistance of coil
10. In a double slit experiment instead of slits of equal widths, one slit is made twice as wide as the other. Then in the interference pattern
  - (a) the intensity of both the maxima and the minima increase
  - (b) the intensity of maxima increases and the minima has zero intensity
  - (c) the intensity of maxima decreases and the minima increases
  - (d) the intensity of maxima decreases and the minima has zero intensity
11. The work function for a metal is 3 eV. To emit a photoelectron of energy 2 eV from the surface of this metal, the wavelength of the incident light should be:
  - (a) 6187 Å
  - (b) 4125 Å
  - (c) 12375 Å
  - (d) 2486 Å
12. The ratio of energies of the hydrogen atom in its first to second excited state is
  - (a) 1 : 4
  - (b) 4 : 1
  - (c) -4 : -9
  - (d) -1/4 : -1/9
13. Which is reverse biased diode?



14. The voltage across a resistor, an inductor and a capacitor connected in series to an ac source are 20 V, 15 V and 30 V respectively. The resultant voltage in the circuit is
  - (a) 5 V
  - (b) 20 V
  - (c) 25 V
  - (d) 65 V

15. The variation of potential  $V$  with  $r$  and electric field  $E$  with  $r$  for a point charge is correctly shown in the graph



**Assertion – Reason: 16 to 18**

Two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both A and R are true and R is the correct explanation of A
- (b) Both A and R are true and R is NOT the correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is also false

16. **Assertion (A):** At a fixed temperature, silicon will have a minimum conductivity when it has a smaller acceptor doping

**Reason (R):** The conductivity of an intrinsic semiconductor is slightly higher than that of a lightly doped p-type

17. **Assertion (A):** No interference pattern is detected when two coherent sources are infinitely close to each other.

**Reason (R):** Fringe width is inversely proportional to separation between the slits.

18. **Assertion (A):** If intensity of incident light is doubled, the kinetic energy of photoelectron is also doubled.

**Reason (R):** The kinetic energy of photoelectron is directly proportional to intensity.

**SECTION B**

19. Electromagnetic waves with wavelength

- (i)  $\lambda_1$  is used in satellite communication.
- (ii)  $\lambda_2$  is used to kill germs in water purifier.
  - (a) Identify and name the part of electromagnetic spectrum to which these radiation belong
  - (b) Arrange these wavelengths in ascending order of their magnitude.

20. The radius of innermost electron orbit of a hydrogen atom is  $5.1 \times 10^{-11}$  m. What is the radius of orbit in the second excited state?

21. A difference of 2.3 eV separates two energy levels in an atom. What is the frequency of radiation emitted when the atom makes transition from the upper level to the lower level?

OR

The nuclear radius of  $^{27}\text{Al}$  is 3.6 fermi. Find the nuclear radius of  $^{64}\text{Cu}$ .

22. A concave lens of refractive index 1.5 is immersed in a medium of refractive index 1.65. What is the nature of the lens?

23. (a) A germanium p-n junction is connected to a battery with millimeter in series. What should be the minimum voltage of battery so that current may flow in the circuit?

(b) What happens when a forward bias is applied to a p-n junction?

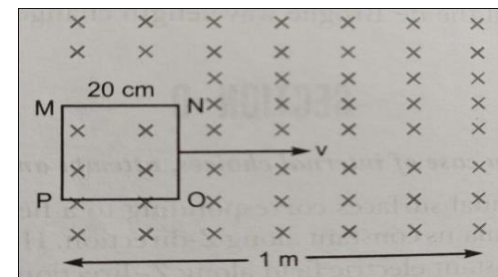
24. In Young's double slit experiment the slits are separated by 0.28 mm and the screen is placed 1.4 m away. The distance between the central bright fringe and the fourth bright fringe is measured to be 1.2 cm. Determine the wavelength of light used in this experiment.

25. Two identical point charges,  $q$  each, are kept 2m apart in air. A third point charge  $Q$  of unknown magnitude and sign is placed on the line joining the charges such that the system remains in equilibrium. Find the position and nature of  $Q$ .

**SECTION C**

26. A straight thick long wire of uniform circular cross-section of radius 'a' is carrying a steady current  $I$ . The current is uniformly distributed across the cross-section. Use Ampere's circuital law to obtain a relation showing the variation of the magnetic field outside the wire with distance 'r' ( $r > a$ ). Plot a graph showing the nature of this variation.

27. A square loop MNOP of side 20 cm is placed horizontally in a uniform magnetic field acting vertically downwards as shown in the figure. The loop is pulled with a constant velocity of  $20 \text{ cms}^{-1}$  till it goes out of the field.



(a) Depict the direction of the induced current in the loop as it goes out of the field. For how long would the current in the loop persist?

(b) Plot a graph showing the variation of magnetic flux and induced emf as a function of time.

- 28.** A coil of inductance 0.50 H and resistance 100  $\Omega$  is connected to a 240 V, 50 Hz ac supply (a) What is the maximum current in the coil?  
 (b) What is the phase difference between the applied voltage and current? Which of them is ahead?

**OR**

A resistor R and an inductor L are connected in series to a source  $E = E_0 \sin \omega t$ . Find the

- (a) peak value of the voltage drops across R and L.  
 (b) phase difference between the applied voltage and current. Which of them is ahead?

**29.** A beam of monochromatic radiation is incident on a photosensitive surface. Answer the following questions giving reasons:

- (a) Do the emitted photoelectrons have the same kinetic energy?  
 (b) Does the kinetic energy of the emitted electrons depend on the intensity of incident radiation?  
 (c) On which factors does the number of emitted photoelectrons depend?

**OR**

- (a) Draw a graph showing variation of photocurrent with anode potential for two radiations of intensity  $I_1$  and  $I_2$  ( $I_1 > I_2$ ). Mark saturation current and stopping potential.  
 (b) If the potential difference used to accelerate electron is doubled, by what factor does the de Broglie wavelength associated with the electron change?

**30.** Determine the value of the de Broglie wavelength associated with the electron orbiting in the ground state of hydrogen atom ( Given  $E_n = -(13.6/n^2)$  eV and Bohr radius  $r_0 = 0.53 \text{ \AA}$ ). How will the de Broglie wavelength change when it is in the first excited state?

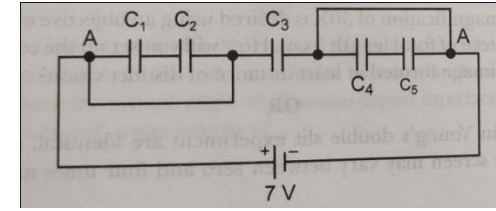
**SECTION D**

**31.** (a) Derive an expression for the capacitance of a parallel plate capacitor, whose plates are separated by a dielectric medium.

- (b) In the following arrangement of capacitors, find the  
 (i) equivalent capacitance of the network between points A and B.

Given:  $C_1 = C_5 = 8 \mu\text{F}$ ,  $C_2 = C_3 = C_4 = 4 \mu\text{F}$

- (ii) maximum charge supplied by the battery  
 (iii) Total energy stored in the network.



[2+3]

**OR**

- (a) Derive the expression for the electric potential at any point along the axial line of an electric dipole.  
 (b) Obtain the expression for the electric field intensity due to uniformly charged spherical shell of radius R at a point distant r from the centre of shell outside it.

[2+3]

**32.** (a) Define the term 'mobility' of charge carriers in a current carrying conductor. Obtain the relation for mobility in terms of relaxation time.

(b) A variable resistor R is connected across a cell of emf E and internal resistance r.

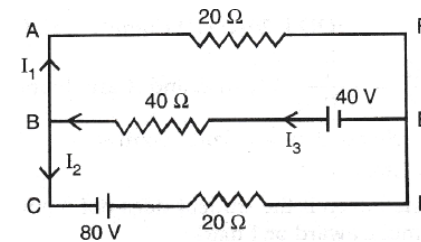
- (i) Draw the circuit diagram.  
 (ii) Plot the graph showing variation of potential drop across R as function of R.  
 (iii) At what value of R current in the circuit will be maximum?

[2+3]

**OR**

(a) Using the concept of free electrons in a conductor, derive the relation between current density and the applied electric field.

(b) Use Kirchoff's laws to determine the value of current  $I_1$  in the given circuit.



[2+3]



33. (a) What is the effect on the interference fringes in double slit experiment due to each of the following operations? Justify your answer.

(i) The screen is moved away from the plane of the slits.

(ii) The separation between slits is increased.

(iii) The source slit is moved closer to the plane of the double slit.

(b) The refractive index of the material of a prism is 1.5. When the prism is in minimum deviation position, the angle of incidence is  $51^\circ$ . Calculate the angle of prism and angle of minimum deviation.

[3+2]

**OR.**

(a) In what way is the diffraction from each slit related to interference pattern in double slit experiment?

(b) A converging lens of focal length 6.25 cm is used as a magnifying glass. If the near point of the observer is 25 cm from the eye and the lens is held close to the eyes, calculate

(i) the distance of the object from the lens and

(ii) angular magnification.

[2+3]

### **SECTION E**

#### **Case Study:**

**Read the following paragraph and answer the questions.**

34. A number of optical devices and instruments have been designed and developed such as periscope, binoculars, microscopes and telescopes utilizing the reflecting and refracting properties of mirrors, lenses and prisms. Most of them are in common use. Our knowledge about the formation of images by the mirrors and lenses is the basic requirement for understanding the working of these devices.

(a) Write two distinct advantages of a reflecting type telescope over a refracting type telescope.

(b) How is the working of a telescope different from that of a microscope?

(c) A reflecting type telescope has a concave reflector of radius of curvature 120 cm. Calculate the focal length of the eye piece to achieve a magnification of 20.

**OR**

(c) The focal length of objective and eye-piece of a compound microscope are 1.2 cm and 3.0 cm respectively. The object is placed at a distance of 1.25 cm from the objective. If the final image is formed at infinity, then what would be the magnifying power of the microscope?

[1+1+2]

#### **Case Study:**

**Read the following paragraph and answer the questions.**

35. Materials are classified on the basis of their conductivity as metals, semiconductors and insulators. Metals are having low resistivity and high conductivity while semiconductors are having resistivity and conductivity in between metals and insulators. And finally insulators are those which are having high resistivity or very low conductivity. Semiconductors may exist as elemental semiconductors and also compound semiconductors. Si and Ge are elemental semiconductor and CdS, GaAs, CdSe, anthracene, polypyrrole etc. are the compound semiconductors.

Each electron in an atom has different energy level and such different energy levels continuing forms the band of energy called as energy bands. That energy band which has energy levels of Valence electrons is called as Valence band. And the energy band which is present above the Valence band is called as conduction band. On the basis of energy bands materials are also defined as metals, semiconductors and insulators. In case of metals, conduction band and Valence band overlaps with each other due to which electrons are easily available for conduction. In case of insulators, there is some energy gap between conduction band and Valence band due to which no free electrons are easily available for conduction. And in semiconductors, there is a small energy gap between conduction band and Valence band and if we give some external energy then electron from Valence band goes to conduction band due to which conduction will be possible. These semiconductors are classified as intrinsic semiconductors and extrinsic semiconductors also. Intrinsic semiconductors are those semiconductors which exist in pure form. And intrinsic semiconductors has number of free electron is equal to number of holes. The semiconductors doped with some impurity in order to increase its conductivity are called as extrinsic semiconductors. Two types of dopants are used they are trivalent impurity and pentavalent impurity also. The extrinsic semiconductors doped with pentavalent impurity like Arsenic, Antimony, Phosphorus etc are called as n-type semiconductors. In n type semiconductors electrons are the majority charge carriers and holes are the minority charge carriers. When trivalent impurity is like Indium, Boron, Aluminium etc are added to extrinsic semiconductors then p type semiconductors will be formed. In p type semiconductors holes are majority charge carriers and electrons are the minority charge carriers.

(a) In case of p-type semiconductor \_\_\_\_\_

(i)  $n_h \ll n_e$  (ii)  $n_h = n_e$  (iii)  $n_h \gg n_e$  (iv)  $n_h = n_e = 0$

(b) An intrinsic semiconductor behaves like \_\_\_\_\_ at  $T = 0K$

(i) conductor (ii) metal (iii) non metal (iv) insulator

(c) If the energy band gap  $E_g > 3 eV$  then such materials are called as

(i) conductors (ii) insulator (iii) semiconductors (iv) superconductors

(d) What is energy band gap in case of materials?

**OR**

(d) How p-type and n-type semiconductors are formed? [1+1+1+1]

**Page 8**

**General Instructions:**

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
- (iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (v) Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION-A

1. An infertile couple was advised to undergo In vitro fertilization by the doctor. Out of the options given below, select the correct stage for transfer to the fallopian tube for successful results?

- (a) Zygote only
- (b) Zygote or early embryo upto 8 blastomeres
- (c) Embryos with more than 8 blastomeres
- (d) Blastocyst Stage

1

2. Given below are four contraceptive methods and their modes of action. Select the correct match:

| Method       | Mode of action                            |
|--------------|---|
| a) Condom    | (i) Ovum not able to reach Fallopian tube |
| b) Vasectomy | (ii) Prevents ovulation                   |
| c) Pill      | (iii) Prevents sperm reaching the cervix  |
| d) Tubectomy | (iv) Semen contains no sperms             |

- (a) a)–(i) b)–(ii) c)– (iii) d)–(iv)
- (b) a)–(ii) b)–(iii) c)–(iii) d) – (i)
- (c) a)–(iii) b)–(iv) c)–(ii) d)–(i)
- (d) a)–(iv) b)–(i) c)– (iii) d)–(ii)

1

3 Which of the following amino acid residues will constitute the histone core?

- (a) Lysine and Arginine
- (b) Asparagine and Arginine
- (c) Glutamine and Lysine
- (d) Asparagine and Glutamine

1

4 Evolutionary convergence is development of a

- (a) common set of functions in groups of different ancestry.
- (b) dissimilar set of functions in closely related groups.
- (c) common set of structures in closely related groups.
- (d) dissimilar set of functions in unrelated groups.

1

5. *Apis mellifera* are killer bees possessing toxic bee venom. Identify the treatment and the type of immunity developed from the given table to treat a person against the venom of this bee.

| Remedy                    | Immunity |
|---------------------------|----------|
| (a) Inactivated proteins  | Active   |
| (b) Proteins of the venom | Passive  |
| (c) Preformed antibodies  | Passive  |
| (d) Dead micro-organisms  | Active   |

1

6. Interferons are most effective in making non-infected cells resistant against the spread of which of the following diseases in humans?

- (a) ascariasis
- (b) ringworm
- (c) amoebiasis
- (d) AIDS

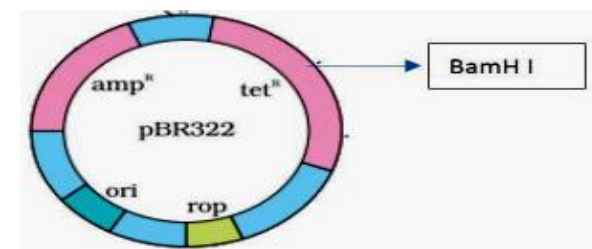
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7. Which of the following water samples in the table given below, will have a higher concentration of organic matter?

| Water Sample | Level of pollution | Value of BOD |
|--------------|--------------------|--------------|
| (a)          | High               | High         |
| (b)          | Low                | Low          |
| (c)          | Low                | High         |
| (d)          | High               | Low          |

1

8. The figure below shows the structure of a plasmid.



A foreign DNA was ligated at BamH1. The transformants were then grown in a medium containing antibiotics tetracycline and ampicillin. Choose the correct observation for the growth of bacterial colonies from the given table

| Medium with Tetracycline | Medium with Ampicillin |   |
|--------------------------|------------------------|---|
| (a) Growth               | No growth              |   |
| (b) No growth            | Growth                 |   |
| (c) No growth            | No Growth              |   |
| (d) Growth               | Growth                 | 1 |

9. Swathi was growing a bacterial colony in a culture flask under ideal laboratory conditions where the resources are replenished. Which of the following equations will represent the growth in this case?

(Where population size is N, birth rate is b, death rate is d, unit time period is t, and carrying capacity is K).

|                          |                          |   |
|--------------------------|--------------------------|---|
| (a) $dN/dt = KN$         | (b) $dN/dt = r N$        |   |
| (c) $dN/dt = r N(K-N/K)$ | (d) $dN/dt = r N(K+N/K)$ | 1 |

10. Sea Anemone gets attached to the surface of the hermit crab. The kind of population interaction exhibited in this case is

|                 |                   |   |
|-----------------|-------------------|---|
| (a) amensalism. | (b) commensalism. |   |
| (c) mutualism.  | (d) parasitism.   | 1 |

11. Which of the following food chains is the major conduit for energy flow in terrestrial and aquatic ecosystems respectively?

| Terrestrial Ecosystem | Aquatic Ecosystem |   |
|-----------------------|-------------------|---|
| (a) Grazing           | Grazing           |   |
| (b) Detritus          | Detritus          |   |
| (c) Detritus          | Grazing           |   |
| (d) Grazing           | Detritus          | 1 |

12 Which of the following is an example of *ex situ* conservation?

|                       |                   |   |
|-----------------------|-------------------|---|
| (a) Sacred Groves     | (b) National Park |   |
| (c) Biosphere Reserve | (d) Seed Bank     | 1 |

**Question No. 13 to 16** consist of two statements – Assertion (A) and Reason (R).

Answer these questions selecting the appropriate option given below:

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is not the correct explanation of A.

C. A is true but R is false.

D. A is False but R is true.

13. Assertion: Apomictic embryos are genetically identical to the parent plant.

Reason: Apomixis is the production of seeds without fertilization. 1

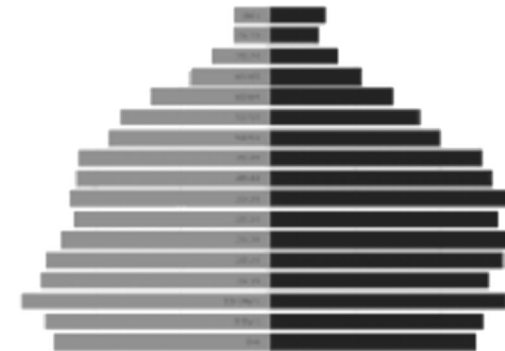
14. Assertion: When white eyed, yellow bodied *Drosophila* females were hybridized with red eyed, brown-bodied males; and F1 progeny was intercrossed, F2 ratio deviated from 9 : 3 : 3 : 1.

Reason: When two genes in a dihybrid are on the same chromosome, the proportion of parental gene combinations is much higher than the non-parental type. 1

15. Assertion: Functional ADA cDNA genes must be inserted in the lymphocytes at the early embryonic stage.

Reason: Cells in the embryonic stage are mortal, differentiated and easy to manipulate. 1

16. Given below is the Age Pyramid of population in one of the states in India as per 2011 census. It depicts the male population on the left hand side, female population on the right hand side, newborns towards the base and gradually increasing age groups as we move from base to the top, with the oldest population at the top. Study this pyramid and comment upon the appropriateness of the Assertion and the Reason.



Assertion: It is a stable population.

Reason: The pre-reproductive and reproductive individuals are almost in equal numbers and the post-reproductive individuals are relatively fewer. 1

SECTION- B

17. In the figure given below, parts A and B show the level of hormones which influence the menstrual cycle. Study the figure and answer the questions that follow:

- (a) Name the organs which secrete the hormones represented in parts A and B.  
 (b) State the impact of the hormones in part B on the uterus of the human female during 6 to 15 days of menstrual cycle? 2

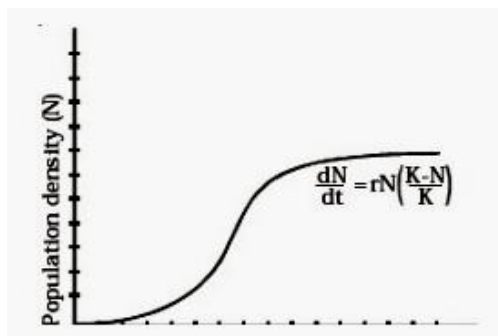
18. A true breeding pea plant, homozygous dominant for inflated green pod is crossed with another pea plant with constricted yellow pods (ffgg). With the help of punnett square show the above cross and mention the results obtained phenotypically and genotypically in F1 generation? 2

19 During a field trip, one of your friend in the group suddenly became unwell, she started sneezing and had trouble in breathing. Name and explain the term associated with such sudden responses. What would the doctor recommend for relief? 2

20. CTTAAG  
 GAATTC

- (a) What are such sequences called? Name the enzyme used that recognizes such nucleotide sequences.  
 (b) What is their significance in biotechnology? 2

21. Interpret the following growth curve.



OR  
 Write four attributes applied in the human population census. 2

SECTION - C

22 Explain the functions of the following structures in the human male reproductive system.

- (a) Scrotum (b) Leydig cells (c) Male accessory glands 3

23 State the agent(s) which helps in pollinating in the following plants. Explain the

adaptations in these plants to ensure pollination:

- (a) Corn (b) Water hyacinth (c) *Vallisneria* 3

24 (a) Identify the polarity of x to x' in the diagram below and mention how many more amino acids are expected to be added to this polypeptide chain. 3

(b) Mention the codon and anticodon for alanine.

(c) Why are some untranslated sequences of bases seen in mRNA coding for a polypeptide? Where exactly are they present on mRNA?

25 (a) How is Hardy-Weinberg's expression " $(p^2 + 2pq + q^2) = 1$ " derived?

(b) List any two factors that can disturb the genetic equilibrium. 3

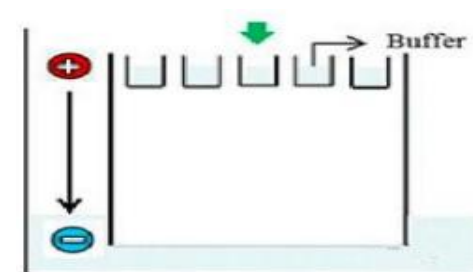
26 Highlight the structural importance of an antibody molecule with a diagram. Name the four types of antibodies found to give a humoral immune response, mentioning the functions of two of them you have studied.

OR

(a) Explain the Life cycle of Plasmodium starting from its entry in the body of female Anopheles till the completion of its life cycle in humans.

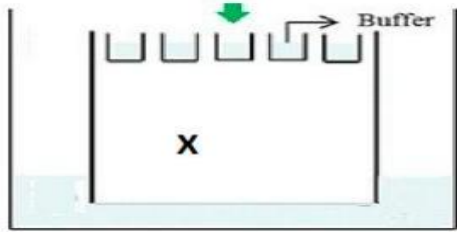
(b) Explain the cause of periodic recurrence of chill and high fever during malarial attack in humans. 3

27 Carefully observe the given picture. A mixture of DNA with fragments ranging from 200 base pairs to 2500 base pairs was electrophoresed on agarose gel with the following arrangement.



(a) What result will be obtained on staining with ethidium bromide? Explain with reason.

(b) The above set-up was modified and a band with 250 base pairs was obtained at X.



What change(s) were made to the previous design to obtain a band at X? Why did the band appear at the position X? 3

28 (a) There was loss of biodiversity in an ecosystem due to a new construction project in that area. What would be its impact on the ecosystem? State any three. (b) List any three major causes of loss of biodiversity? 3

#### SECTION-D

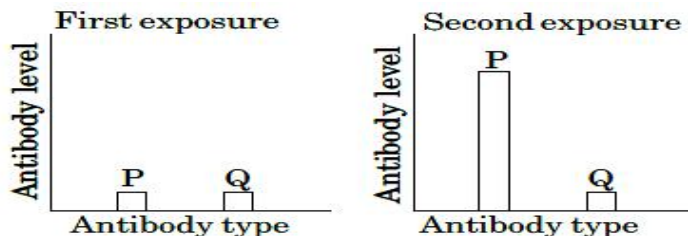
29. In prokaryotes, DNA is circular and present in the cytoplasm but in eukaryotes, DNA is linear and mainly confined to the nucleus. DNA or deoxyribonucleic acid is a long polymer of nucleotides. In 1953, the first correct double helical structure of DNA was worked out by Watson and Crick. Based on the X-ray diffraction data produced by Maurice Wilkins and Rosalind Franklin. It is composed of three components, i.e., A phosphate group, a deoxyribose sugar and a nitrogenous base. Different forms of DNA are B-DNA, Z-DNA, A-DNA, C-DNA and D-DNA.

- (i) Name the linkage present between the nitrogen base and pentose sugar in DNA.
- (ii) Who proposed the double helix structure of DNA.
- (iii) Draw and describe the double helical model of B-DNA.

OR

Draw and describe nucleosome. 4

30. In a study to test a new vaccine against a viral disease, mouse model testing is done. In this process, mice are vaccinated and their blood samples were tested. Mice developed mild disease symptom. After few days those mice were again infected with the virus. This time they do not show any disease symptoms. Their blood samples were tested. Two graphs show antibody concentration for the first and second infection in mice blood.



Based on the above information, answer the following questions.

- (i) What does P and Q in the given graphs indicate?
- (ii) How does vaccination works.
- (iii) What form of antigen is used here? 1+2+1

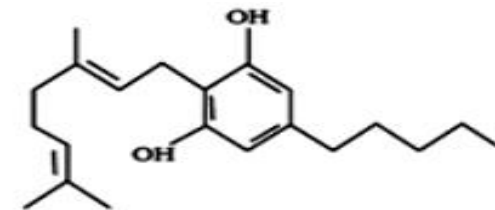
#### SECTION-E

31. What are the post transcriptional modifications seen in eukaryotes and why are they necessary?

OR,

- (a) List any four major goals of Human Genome project (HGP).
- (b) Write any four ways the knowledge from HGP is of significance for humans.
- (c) Expand BAC and mention its importance. 5

32.



- (a) Name the group of drugs this structure represents.
- (b) List the modes of consumption of this drug
- (c) Which organ of the body is affected by the consumption of this drug?
- (d) What are the signs of withdrawal syndrome?

OR

How to detect cancer? What are a few approaches to treat cancer? 5

33. Explain the principle involved in ELISA. How does PCR helps in diagnostic medicine.

OR,

What are the drawbacks of the insulin obtained from slaughtered cows and pigs?

What are the advantages of recombinant insulin? 5

**General Instructions:**

1. This question paper consists of 34 questions.
2. Marks are indicated against each question.
3. Answer should be brief and to the point.
4. Answers to the questions carrying 3 marks may be from 50 to 75 words.
5. Answers to the questions carrying 4 marks may be about 150 words.
6. Answers to the questions carrying 6 marks may be about 200 words.
7. Attempt all parts of the questions together.

1] Which of the following is not a feature of management? [1]

- (a) Continuous process
- (b) Goal-oriented process
- (c) A group activity
- (d) Increases efficiency

2] Food safety is becoming a growing global concern with regulatory regimes worldwide facing the challenge of minimising food safety risks. With India being one of the biggest markets for the import of various kinds of food products from across the globe, food safety has become a major concern for our country. The government is focusing on the delivery of safe and wholesome food to its citizens by setting up a single unified established standard. Enactment of the Food Safety and Standards Act, 2006 (FSSA) is a major step taken by the government in this direction. Identify the related dimension of business environment. [1]

- (a) Legal dimension.
- (b) Social dimension
- (c) Political dimension
- (d) All of the above

3] Which of the following aspect does not relate to the concept of consumer as per Consumer Protection Act 2019. [1]

- (a) Any person who buys any goods for a consideration
- (b) Any person who hires or avails of any service, for a consideration
- (c) Include a person who obtains goods for re-sale or any commercial purpose
- (d) Any user of goods with the approval of the buyer

4] Sneha owns a nursery in Faridabad, she is now planning to venture into the business of setting up a portal for selling terrarium plants (art of growing plants inside glass jars with a narrow opening). The market for indoor plants in India is estimated at over 250 crores annually and is growing at 15% to 20%. The terrarium

plants require less water and are much in demand now with houses becoming small and virtually no gardens for people residing in apartments in metro cities. The above case highlights one of the points related to the importance of business environment and its understanding by managers. Identify it. [1]

- (a) It helps in coping with rapid changes
- (b) It helps in improving performance
- (c) It helps the firm to identify threats and early warning signals
- (d) It enables the firm to identify opportunities and getting the first mover advantage

5] Which of the following is not a component of social environment of business?[1]

- (a) Growth rate
- (b) Per capita income
- (c) Composition of population
- (d) Life expectancy of people

6] In order to be ahead of its global competitor Awasthi Telecom has decided up its future course of action through re-farming spectrum and aggressive fabrication of towers. Identify the related point with reference to importance of understanding business environment. [1]

- (a) It helps in assisting in planning and policy formulation
- (b) It helps in coping with rapid changes
- (c) It helps in improving performance
- (d) It enables the firm to identify opportunities and getting the first mover advantage

7] Which of the following statement does not reflect a condition to be satisfied for and exchange to take place? [1]

- (a) Involvement of at least two parties the buyer and the seller
- (b) Each party should be capable of offering something of value to the other
- (c) Exchange can take place even if the buyers and sellers are not able to communicate with each other
- (d) Each party should have freedom to accept or reject other party's offer

8] The technique of Functional foremanship is an extension of the principle of .....to the shop floor. [1]

- (a) Discipline
- (b) Equity
- (c) Division of work
- (d) Order

9] High Steel Ltd.' an Indian company producing 70 million tonnes of steel annually and generating revenue of 40 billion US dollars has recently acquired the world's

third largest steel producing company, Heal Steels Ltd.'. For this acquisition High Steels Ltd. had to arrange about ₹70,000 crores of rupees through debt and equity. State the decision made by the company for arranging the funds through debt and equity. [1]

- (a) Financial decision (b) Financial planning  
(c) Investment decision (d) Dividend decision

10] The companies can declare..... dividends if the tax on dividend is lower.[1]

- (a) High (b) Low  
(c) Either high or low (d) All of the above

11] When Aniket joined his father in his business his father told him that all manager from top executive to supervisor performs the function of directing in the organisation Identify the related characteristics of directing being discussed above. [1]

- (a) Directing initiates action  
(b) Directing takes place at every level of management  
(c) Directing is a continuous process  
(d) Directing flows from top to bottom

12] Many reputed business organisations keep a database of unsolicited applicants in their offices. Identify the related external source of recruitment . [1]

- (a) Campus recruitment (b) Promotion  
(c) Casual callers (d) Direct Recruitment

13] The plans are monitored to ensure that the desired objective achieved efficiently and effectively. Identify the related step in the planning process as described in above line [1]

- (a) Determining planning premises (b) Follow up  
(c) Evaluating all the alternatives (d) Implementing a plan

14] Match the following by choosing the correct option: [1]

| Column A |   | Column B |           |
|----------|---|----------|-----------|
| (i)      | Violation may lead to imposition of penalties     | (A)      | Policy    |
| (ii)     | (i) It defines the way of doing a respective job. | (B)      | Procedure |
| (iii)    | It is a general statement.                        | (C)      | Rule      |
| (iv)     | It is framed to implement a policy                | (D)      | Method    |

- (a) (i)-(C); (ii)-(D); (iii)-(A); (iv)-(B) (b) (i)-(C); (ii)-(B); (iii)-(A); (iv)-(D)  
(c) (i)-(B); (ii)-(D); (iii)-(A); (iv)-(C) (d) (i)-(C); (ii)-(A); (iii)-(D); (iv)-(B)

15] Under this method of training the trainee is kept under guidance of a master worker for a prescribed period of time. [1]

- a) Apprenticeship training (b) Internship training  
(c) Vestibule training (d) None of the above

16] Statement I: Motivation is a complex process [1]

Statement II: The people are homogeneous in their expectations, perceptions and reactions.

- (a) Both the Statement I and Statement II are true  
(b) Both the Statement I and Statement II are false  
(c) Statement I is true but Statement II is false  
(d) Statement 1 is false but Statement II is true

17] Sandeep is a Professor in Management in a reputed institute. He first made his students understand the concept of delegation then he made them aware of another process which is an extension of delegation and is essentially carried out in every large scale organisation. It involves dispersal of authority up to the lowest level within an organisation. After explaining the various elements of delegation, he decided to hold a class quiz. The excerpt from the same is shared below. Identify the other process which Sandeep appraised his students about? [1]

- (a) Delegation (b) Decentralisation  
(c) Span of management (d) Centralisation

18] ..... rises from the established scalar chain which links the various job positions and levels of an organisation. [1]

- (a) Authority (b) Responsibility  
(c) Accountability (d) None of the above

19] Formal communication may flow from. [1]

- (a) Superior to subordinate (b) Subordinate to superior  
(c) Amongst two managers at the same level (d) All of the above

20] ..... may be defined as the framework within which managerial and operating tasks are performed. [1]

- (a) Organisational structure (b) Delegation  
(c) Decentralisation (d) None of the above

21] Health Foods Limited is a chain of frozen foods. Due to lack of sufficient number of delivery boys the company is facing a lot of problems these days. [3]

(a) Identify the function of management which will help the company to obtain the required the number of persons.

(b) Describe briefly the two kinds of analysis that will help the company to estimate its manpower requirements clearly.

22] Beliram is working as a superintendent in a glass making factory in Nashik for the past 20 years. Since glass production is a complex process he constantly guides and motivates his subordinates and clarifies their doubts in performing a task. This helps the workers to achieve the work targets given to them. [3]

(a) Identify the function of management being discussed above.

(b) State any two features of the function of management as identified in part (a) the question.

23] Describe any three functions of Financial Market. [3]

Or

State any three developmental functions of SEBI.

24] Mayank purchased a pack of chocolates of a renowned brand for his daughter from a shop in the nearby market. After consuming the chocolates, his daughter fell sick. He filed a case with the District forum against the renowned brand. He lost the case because of a mistake that he could not provide proof of purchase. What should be kept in mind by a consumer while purchasing, using and consuming goods and services apart from avoiding the mistake committed by Mayank, in order to enable him/her to achieve the objective of consumer protection? Enumerate any three points. [3]

OR

Recently, on the complaint of Damodar Kolkata resident of Thane city the District Consumer Disputes Redressal Forum Thane has placed a ban on 'Mishthan Bhandar a sweet shop in the city. The shopkeeper has been asked it to withdraw the artificially coloured sweets from the market for sale. This is because through a laboratory test it has been certified that these sweets contained inedible and unsafe colours which could cause serious harm to human health. Identify and explain the various rights of consumers relating to the above case. [3]

25] Piyush Ltd. is a multinational consulting company with its headquarters at Bengaluru. It hires young people from different countries of the world. It is a company in which people dream to work because of its work-environment, pay and growth prospects. The company has a culture of open communication and people of various nationalities work together in a discrimination free environment. The behaviour of managers of Piyush Ltd. emphasises kindness and justice which ensures loyalty and devotion of workers. It also promotes mutual trust and belongingness among team members. In this way management of Piyush Ltd. is able to achieve its objectives by promoting team work. By doing so Managers of Piyush Ltd. are following some principles of management.

Identify and explain any two such principles. [4]

26] The present earnings of a company before interest and tax is ₹10 lakhs. The company wants to increase its total capital investments by 50% through an additional issue of 10% debentures. At present the total capital of the company is ₹50 lakhs, out of which ₹40 lakhs has been raised through equity and rest through 10% debentures. The tax is levied @ 40%. The face value of an equity share is ₹10 and that of a debenture is ₹100.

(a) Assuming the Rate of return on investment to be same, calculate the projected EPS of the company on issuing additional debentures. Show your working clearly.

(b) Do you think the company has taken the right decision by choosing debt to raise further capital? Name the concept underlying this decision. [4]

27] "Management as an art and a science are not mutually exclusive, but complement each other." Explain the statement. [4]

OR

Three groups of employees of Gama Limited' are working at different posts. The first group of employees is responsible for the welfare and survival of the organisation. In order to discharge its responsibility properly, this group continuously keeps a watch over the Business Environment With a view to coping with the changes going on in the Business Environment; this group immediately discusses the change to be brought about in the company's plans. The second group of employees is responsible for maintaining quality and safety standards, and minimising wastages.



The responsibility of third group of employees is to explain the policies decided by the top management and developing the feeling of cooperation among all the departments of the company.

- (a) Identify the concept of management described in the paragraphs given above.
- (b) Identify the three types of the concept identified in 'a' by quoting the relevant lines. [4]

28] The Divyang School Diwali Mela is one of the most popular Melas in Delhi which portrays the hidden talents and skills among the students of the Divyang School. This adds a lot of emotional value to the products as the diyas and candles mainly give us light, but are made by those who cannot enjoy its brightness. Divyang School Relief Association in New Delhi organizes this event every year. One can find candles, lamps, handmade chocolates, sweets and home décor items at reasonable prices. The candles made by such students are the best among these. For ensuring the Diwali Mela to take place successfully, the whole work is divided into various task groups like decoration committee, food committee and ticketing committee. All these are put under overall supervision of the official in charge of the event. In context of the above case:

- (a) Identify and explain the function of management being performed in this case,
- (b) Describe briefly any two points highlighting the importance of the function of management as identified in part (a) of the question. [4]

29] Madhur started a catering business in Ludhiana one year back. However, despite his utmost sincerity towards the work his business has not been able to make a place for itself in the market. The clients never seem to be with his services. One of the prime reasons for this is he is not able to instruct his staff clearly as to what they should do. Moreover, he fails to provide effective guidance and inspiration to them to ensure that his instructions are implemented in proper perspective. As a result, his business is running into major losses and he now plans to shut down his business. In context of the above case:

- (a) Name and explain the managerial function which Madhur is unable to perform and is leading to the closure of his business.
- (b) Briefly explain the four categories into which the main activities related to the function as identified in part (a) may broadly be grouped. [4]

30] In a shoe manufacturing company it has been observed that the deviations have increased drastically and the projects are running behind schedule.

- (a) Name the related function of management which has helped to identify these discrepancies.
- (b) What does the function as identified in part (a) of the question ensure?
- (c) Give the meaning of 'deviation'.
- (d) Identify any two possible causes of deviations and the corrective action to be taken. [4]

31] Identify the function of management which refers to the process of instructing, guiding, counselling, motivating and leading people in the organisation to achieve objectives. Explain the importance of this function of management. [6]

OR

"Formal organisation is considered better than informal organisation." Do you agree with this statement? Give reasons. [6]

32] Rajesh owns a small hotel in Goa. Over the years his business has earned good reputation because of the efficient services provided to the guests. The hotel staff works diligently for every guest right from the time of booking till check out. All the departments in his hotel work in a synchronised manner and the possibility of error is almost negligible. Identify the quality of management which has taken his business to greater heights. Why the presence of this quality is considered important in all types of business enterprises? [6]

33] Tata International Ltd, earned a net profit of 50 crores. Ankit, the Finance Manager of Tata International Ltd. wants to decide how to appropriate these profits. Identify the decision that Ankit will have to take and also discuss any five factors which will help him in taking this decision. [6]

34] Sakshi is planning to sell homemade cookies in different flavours. She feels that there is no need to put any label on the packs. Do you agree with her? Give any four reasons in support of your answer. [6]

OR

"Anything that is of value to others can be marketed." In light of this statement explain briefly any six things that can be marketed. [6]

# Modi Public School, Siliguri

## Preparatory Examination 2 – 2022-23

Class 12

Accountancy

Time :3 Hr F.M. :80

General Instructions:

- 1] This question paper contains 34 questions. All questions are compulsory.
- 2] This question paper is divided into two parts, Part A and B.
- 3] Part - A is compulsory for all candidates.
- 4] Part - B has two options i.e. (i) Analysis of Financial Statements and (ii) Computerised Accounting. Students must attempt only one of the given options.
- 5] Question 1 to 16 and 27 to 30 carries 1 mark each.
- 6] Questions 17 to 20, 31 and 32 carries 3 marks each.
- 7] Questions from 21, 22 and 33 carries 4 marks each
- 8] Questions from 23 to 26 and 34 carries 6 marks each
- 9] There is no overall choice. However, an internal choice has been provided in 7 questions of one mark, 2 questions of three marks, 1 question of four marks and 2 questions of six marks.

### **PART A (Accounting for Partnership Firms and Companies)**

- 1] A, Band Care partners in a firm sharing profit/loss in the ratio of 2:2:1. On March, 31, 2022, C died. Accounts are closed on Dec., 31 every year. The sales for the year 2021 was ₹8,00,000 and the profits were ₹1,20,000. The sales for the period from Jan 1, 2022 to March 31, 2022 were ₹ 3,00,000. The share of deceased partner in the current year's profits on the basis of sales is [1]  
(A) ₹ 2,250 (B) ₹ 45,000 (C) ₹9,000 (D) ₹24,000
- 2] Manu and Kanu were partners in a firm, sharing profits and losses in the ratio of 2:3. Their fixed capitals were ₹10,00,000 and ₹5,00,000, respectively. They were entitled to an interest on capital @ 10% p.a. The firm earned a profit of ₹60,000 during the year The amount of interest on capital credited to Kanu will be: [1]  
(A) ₹20,000 (B) ₹40,000 (C) ₹36,000 (D) ₹24,000
- 3] The subscribed capital of a company is ₹50,00,000 and the nominal value of the share is ₹100 each. There were no calls in arrear till the final call was made. The final call made was paid on 47,500 shares only. The balance in the calls in arrear amounted to ₹62,500. Calculate the final call on share [1]  
(A) ₹20 (B) ₹7 (C) ₹25 (D) ₹22

OR

XLtd issued ₹40,00,000 equity shares of ₹10 each. The amount payable on these shares was as follows: On application-₹1 per share, On allotment - ₹2 per share, On first call-₹3 per share and on second and final call ₹4 per share. All calls were made and were duly received, except first and second & final call on 2,000 shares held by Raman and second & final call on 1,000 shares held by Krishan. These shares were forfeited. Subscribed and Fully Paid Capital will be [1]  
(A) ₹39,70,000 (B) ₹ 39,82,000 (C) ₹3,99,70,000 (D) ₹3,99,82,000

- 4] Which of the following is not an appropriation of profits? [1]  
(A) Interest on partner's capital (B) Interest on Partner's Loan  
(C) Salary to Partner (D) Commission to Partner
- 5] On dissolution of a firm, a partner took over ₹40,000 investments at 80%. Which one of the following account will be debited/credited with how much amount? [1]  
(A) Partner's Capital Account Debit with ₹32,000  
(B) Partner's Capital Account Credit with ₹40,000  
(C) Realisation Account Credit with ₹40,000  
(D) Realisation Account Debit with ₹8,000

OR

- Joy and Deb were partners sharing profits & losses in the ratio of 2:1. They admitted Gopi into partnership for 1/5 share. At the time of Gopi's admission, Furniture (book value ₹2,50,000) was reduced by 40% and Machinery (book value ₹1,50,000) was reduced to 40%. What was the net decrease in value of assets? [1]
- 6] X, Y and Z are partners in 1:2:3. X is guaranteed that his share of profit will not be less than ₹1,00,000. Any deficiency will be borne by Y and Z in 1:4. Firm's profit was ₹4,50,000. How much deficiency will be borne by Z? [1]  
(A) ₹5,000 (B) ₹20,000 (C) ₹12,500 (D) ₹25,000
  - 7] New ratio is not to be calculated on: [1]  
(A) Admission of a partner (B) Retirement of a partner  
(C) Death of a partner (D) Dissolution of partnership Firm

29] Share Capital ₹8,00,000; Reserve and Surplus ₹4,00,000; General Reserve ₹1,00,000 and Total Assets ₹20,00,000. Proprietary Ratio will be [1]  
 (A) 0.4:1 (B) 0.55: 1 (C) 0.6:1 (D) 0.65: 1

30] Which of the following is not a tool of Financial Statements Analysis? [1]  
 (A) Funds Flow Statement (B) Cash Flow Statement  
 (C) Statement of Profit and Loss (D) Trend Analysis  
 OR

In a cash flow statement, issue of debentures for consideration other than cash is shown under which activity? [1]  
 (A) Operating Activities (B) Investing Activities  
 (C) Financing Activities (D) None of the above

31] Calculate Working Capital Turnover Ratio from the following: [3]  
 Cost of Revenue from Operations ₹8,00,000; Current Assets ₹6,00,000; Total Assets ₹24,00,000; Non-Current Liabilities ₹5,00,000; and Shareholder's Funds ₹15,00,000; Gross Profit Ratio 20% on sales.

32] Under what headings will you show the following items in the Balance Sheet of a Company: [3]  
 (i) Bank Balance (ii) Investments  
 (iii) Outstanding Salary (iv) Authorised Capital  
 (v) Security deposit (vi) Acceptances (B/P)

33] From the given information, calculate the inventory turnover ratio:  
 Revenue from Operations: ₹6,00,000; GP: 20% on cost; Opening Inventory was 2/3rd of the value of Closing Inventory. Closing Inventory was 25% of Revenue from Operations.

OR

Calculate Net Assets Turnover Ratio

|                                  |            |
|----------------------------------|------------|
| Plant & Machinery --             | ₹1,80,000, |
| Intangible Assets (Goodwill) --- | ₹20,000    |
| Non Current Investments---       | ₹40,000    |

8] A and B are partners in a firm having capital balances of ₹90,000 and ₹60,000 respectively. General Reserve appeared in their books at ₹50,000 and advertisement suspense at ₹20,000. They admit for C for 1/3<sup>rd</sup> share and C is to bring proportionate amount of capital. The capital amount of C will be [1]  
 (A) ₹60,000 (B) ₹ 75,000 (C) ₹90,000 (D) ₹1,00,000

9] Swati and Aman were partners in a firm. Their fixed capitals were ₹9,00,000 and ₹3,00,000, respectively. They shared profits in the ratio of their capitals Divya was admitted as a new partner for 1/3<sup>rd</sup> share in the profits of the firm. Divya brought her share of goodwill premium in cash out of which ₹45,000 were credited to the current account of Swati. The amount of goodwill premium brought in by Divya was [1]  
 (A) ₹1,80,000 (B) ₹1,35,000  
 (C) ₹60,000 (D) ₹45,000

10] A, Band Care partners with profit sharing ratio 4:3:2. B retires and goodwill was valued at ₹2,88,000. If A & C share profits in 5:3, find out the goodwill shared by A and C in favour of B [1]  
 (A) 60,000 and 36,000 (B) ₹44,000 and ₹52,000  
 (C) ₹52,000 and ₹44,000 (D) ₹1,56,000 and ₹1,32,000

OR

Assertion (A): Interest on Capital provided to partner is shown in Profit and Loss Appropriation

Reason (R): Interest on Capital provided to partner is charge against profits

(A) (A) is correct but (R) is wrong  
 (B) Both (A) and (R) are correct, but (R) is not the correct explanation of (A)  
 (C) Both (A) and (R) are incorrect  
 (D) Both (A) and (R) are correct, and (R) is the correct explanation of (A) [1]

11] Which of the following is not incorporated in the Partnership Act?

(A) Profit and loss are to be shared equally  
 (B) No interest is to be allowed on capital  
 (C) All loans are to be allowed interest @ 6% p.a.  
 (D) All drawings are to be charged interest [1]

12] A company issued 4,000 equity shares of ₹10 each at par payable as under  
On application ₹3; on allotment ₹2, on first call ₹4 and on final call ₹1 per share.  
Applications were received for 10,000 shares. Allotment was made pro-rata. How  
much amount will be received in cash on allotment? [1]

- (A) ₹ 8,000 (B) ₹ 12,000 (C) Nil (D) None

13] ABC Ltd. issued 50,000, 8% Debentures of ₹10 each at certain rate of premium  
and to be redeemed at 10% premium. At the time of writing off Loss on Issue of  
Debentures, Statement of Profit and Loss was debited with ₹10,000. At what rate of  
premium, these debentures were issued? [1]

- (A) 8% (B) 2% (C) 10% (D) 4%

14] A and B are partners. B draws a fixed amount at the end of every month. Interest  
on drawings is charged @ 15% p.a. At the end of the year, interest on B's drawings  
amounts to ₹16,500. Drawings of B were: [1]

- (A) ₹24,000 p.m. (B) ₹20,000 p.m.  
(C) ₹18,000 p.m. (D) ₹16,000 p.m.

OR

Partner Sushil withdrew equal amount at the end of each quarter from the firm.  
Interest on drawings charged from him for the year ended 31st March 2022 @ 10%  
pa. was ₹9,000. Total amount of drawings was: [1]

- (A) ₹1,80,000 (B) ₹1,44,000 (C) ₹2,40,000 (D) ₹90,000

15] A, B and C are partners sharing profits in 3:2:1. C's share of profits for the year  
ending 31st March 2022 amounts to ₹50,000. Interest allowed on partners' capital is  
₹1,50,000 and A is allowed a salary of ₹5,000 per month. Interest charged on  
partner's drawings is ₹2,000. What was the net profit of the firm before any  
appropriations? [1]

- (A) ₹5,08,000 (B) ₹92,000 (C) ₹2,12,000 (D) ₹4,53,000

16] According to SEBI Guidelines, Minimum Subscription has been fixed  
at ..... of the issued amount. [1]

- (A) 25% (B) 50% (C) 90% (D) 100%

17] A, B and C were partners in a firm sharing profits in the ratio of 1:3:2 They  
decided that with effect from 1st April 2022, they will share profits in the ratio of 4:  
6:5. For this purpose the goodwill of the firm is valued at the total of preceding three  
year's profits. The profits for the years ending 31st March each year were: 2018-  
₹40,000, 2019-₹10,000 (Loss), 2020-₹80,000 (Loss), 2021-₹1,20,000, 2022-  
₹1,40,000. Reserves and Profits appeared in the balance sheet at ₹40,000 and  
₹30,000 respectively. Partners neither want to show goodwill in the books nor want  
to distribute the reserves and profits appearing in the balance sheet. Pass a single  
journal entry to record the change. [3]

18] A, B and C were partners in a firm sharing profits in 3:2:1 ratio. The firm closes  
its books on 31st March every year. B died on 12th June, 2017. On B's death the  
goodwill of the firm was valued at ₹60,000. On B's death his share in the profits of  
the firm till the time of his death was to be calculated on the basis of previous year's  
profit which was ₹1,50,000, Calculate B's share in the profit of the firm. Pass  
necessary journal entries for the treatment of goodwill and B's share of profit at the  
time of his death. [3]

OR

A B and C were partners in a firm. On 1-4-2021 their capitals stood at ₹4,00,000,  
₹2,00,000 and ₹2,00,000 respectively. As per the provisions of the partnership deed:

- (a) A was entitled for a salary of ₹5,000 p.m.  
(b) Partners were entitled to interest on capital at 5% p.a.  
(c) Profits were to be shared in the ratios of capitals.

The net profit for the year ended 31-3-2022 of ₹3,00,000 was divided equally without  
providing for the above terms.

19] Khalifa Ltd. issued on 1st April, 2021, 20,000, 7% Debentures of ₹100 each at  
3% discount redeemable after five years at a premium of ₹5. All the debentures were  
subscribed. During the year ended 31st March, 2022, the company incurred a loss of  
₹1,80,000. Pass the Journal entries for issue of debentures and writing off Loss on  
Issue of Debentures and prepare 'Loss on Issue of Debentures A/c'. [3]

OR

Platinum Ltd. purchased assets of the book value of ₹9,00,000 and took over liabilities of ₹1,60,000 from Emerald Ltd. It was agreed that the purchase consideration settled at ₹8,00,000 be paid by issuing debentures of ₹100 each at a premium of 10%. It was further agreed that any fraction of the debentures be paid in cash. Give journal entries in the books of purchasing company. [3]

20] A, B and C are partners having capitals of ₹50,000 ₹50,000 ₹1,00,000 respectively. Their Current Account balances were A: ₹ 10,000; B: ₹ 5,000 and C: ₹2,000 (Dr.). According to the Partnership Deed the partners were entitled to an interest on Capital @ 10% p.a. C being the working partner was also entitled to a salary of ₹12,000 p.a. The profits were to be divided as:

- (a) The first ₹20,000 in proportion to their capitals.
- (b) Next ₹30,000 in the ratio of 5:3:2.
- (c) Remaining profits to be shared equally.

The firm earned net profit of ₹1,72,000 before charging any of the above items. Prepare Profit and Loss Appropriation Account. [3]

21] Manbir and Nimrat are partners and they admit Anahat into partnership. It was agreed to value goodwill at three years purchase on Weighted Average Profit Method taking profits of last five years. Weight assigned to each year as 1, 2, 3, 4 and 5 respectively to profits for the year ended 31st March, 2014 to 2018 The profits for these years were: ₹70,000, ₹1,40,000, ₹1,00,000, ₹1,60,000 and ₹1,65,000 respectively.

Scrutiny of books of account revealed following information:

- (i) There was an abnormal loss of ₹20,000 in the year ended 31st March, 2014.
- (ii) There was an abnormal gain (profit) of ₹30,000 in the year ended 31st March, 2015.
- (iii) Closing Stock as on 31st March, 2017 was overvalued by ₹10,000.

Calculate the value of goodwill. [4]

22] Pass the necessary Journal entries for the issue of 8% debentures in the following

- (i) 100 debentures of ₹100 each issued at ₹105 each repayable at ₹100 each.
- (ii) 100 debentures of ₹100 each issued at ₹100 each repayable at ₹105 each

- (iii) 100 debentures of ₹100 each issued at ₹105 each repayable at ₹108 each.
  - (iv) 100 debentures of ₹100 each issued at ₹96 each repayable at ₹105 each
- Ignore writing off discount/loss on issue of debentures. [4]

23] Taj Ltd. invited applications for issuing 2,00,000 equity shares of ₹20 each at a premium of ₹5 per share. The amount was payable as follows:

On Application- ₹8 (including premium), On Allotment- ₹5, On First Call- ₹6 and On Second & Final Call- ₹6

Applications for 2,50,000 shares were received. Pro-rata allotment was made to all applicants. Excess money received on application was adjusted towards sums due on allotment. Sachi, who applied for 6,000 shares failed to pay the allotment and first call money and her shares were forfeited after the first call and out of these 2,000 shares were immediately reissued at ₹13 per share, ₹14 per share paid. Second and final call has not been made. Pass necessary journal entries in the books of Taj Ltd. [6]

OR

Ansul Limited issued for public subscription 40,000 equity shares of ₹10 each at a premium of ₹2 per share payable as under: On Application- ₹2 per share, On Allotment- ₹5 per share, On First Call- ₹2 per share and On Second and Final Call- ₹3 per share

Applications were received for 70,000 shares. Allotment was made pro rata to the applicants for 50,000 shares, the remaining applications being refused. Money overpaid on application was applied towards the sum due on allotment. "A", to whom 1,500 shares were allotted, failed to pay the allotment and call money. "B", to whom 2,000 shares were allotted, failed to pay the two calls. The shares of A and B were subsequently forfeited after the second call was made. 3,000 of forfeited shares were reissued at ₹8 per share fully paid. The reissued shares included all of A's shares. Pass Journal entries in the books of the company to record the above transactions. [6]

24] Given below is the Balance Sheet of A and B, who are carrying on partnership business as at March 31, 2017. A and B shared profit and loss in the ratio of 3:2.

| Liabilities          | Amt.     | Assets         | Amt.     |
|----------------------|----------|----------------|----------|
| Bills Payable        | 6,000    | Cash           | 28,750   |
| Creditors            | 30,000   | Sundry Debtors | 80,000   |
| Outstanding Expenses | 14,000   | Stock          | 30,000   |
| Capitals:            |          | Plant          | 1,00,000 |
| A- 2,00,000          |          | Buildings      | 1,50,000 |
| B- <u>150,000</u>    | 3,50,000 | Goodwill       | 11,250   |
|                      | 4,00,000 |                | 4,00,000 |

On that date, they agree to admit C as a partner on the following terms:

- C will get 1/4th share in profits
- New profit sharing ratio shall be 3:3:2.
- Goodwill shall be valued on 2 years' purchase of the past four years' average profits, which were ₹17,000; ₹14,000; ₹15,000 and ₹20,000 respectively
- C will introduce ₹1,00,000 as capital.
- Plant is to be appreciated to ₹1,20,000 and the value of buildings is to be appreciated by ₹20,000.
- Stock is found overvalued by 20%.
- Creditors were unrecorded to the extent of ₹1,000.

Pass Journal entries.

[6]

OR

Following is the Balance Sheet of A, B and C as at 30th September, 2021:

| Liabilities                   | Amt.     | Assets                       | Amt.     |
|-------------------------------|----------|------------------------------|----------|
| Sundry Creditors              | 70,000   | Land and Building            | 5,50,000 |
| A's Brother's Loan            | 40,000   | Patents                      | 10,000   |
| Employee's Provident Fund     | 20,000   | Debtors 1,20,000             |          |
| Reserve Fund                  | 60,000   | Less: Provision <u>6,000</u> | 1,14,000 |
| A's Capital Ac 3,60,000       |          | Sundry Assets                | 40,000   |
| B's Capital A/c 2,50,000      |          | Bank                         | 48,000   |
| C's Capital A/c <u>50,000</u> | 6,00,000 | Cash                         | 8,000    |
| A's Current A/c 40,000        |          | C's Current A/c              | 70,000   |
| B's Current A/c <u>10,000</u> | 50,000   |                              |          |
|                               | 8,40,000 |                              | 8,40,000 |

They decided to dissolve the firm. They following information are given to you:

- Land and Building were sold for ₹5,00,000.
- Debtors for ₹20,000 proved bad and rest paid the amount due at 5% discount

(iii) An unrecorded investment of ₹20,000 was taken over by a creditor at ₹16,000. Remaining creditors were paid at 10% discount.

(iv) There was an outstanding bill for repairs for which ₹10,000 were paid.

(v) A's brother's loan was paid together with interest of ₹4,000.

(vi) B is to take over some of Sundry Assets at ₹13,500 (being 10% less than book value).

vii) C is to take over the remaining Sundry Assets at 80% of the book value less ₹500 as discount.

Prepare realisation account and Bank Account.

[6]

25] P. and R were partners in a firm sharing profits in the ratio of 3:2:1 respectively.

On March 31, 2022, the balance sheet of the firm stood as follows:

Balance Sheet as at March 31, 2022

| Liabilities       | ₹      | Assets                  | ₹      |
|-------------------|--------|-------------------------|--------|
| Creditors         | 13,000 | Cash                    | 4,700  |
| Bills Payable     | 590    | Debtors                 | 8,000  |
| Capital Accounts: |        | Stock                   | 11,690 |
| P- 15,000         |        | Buildings               | 23,000 |
| Q- 10,000         |        | Profit and loss Account | 1,200  |
| R- <u>10,000</u>  | 35,000 |                         |        |
|                   | 48,590 |                         | 48,590 |

Qretired on the above-mentioned date on the following terms:

(i) Buildings to be appreciated by ₹7,000

(ii) A provision for doubtful debts to be made at 5% on debtors.

(i) Goodwill of the firm is valued at ₹18,000

(iv) ₹2,800 was to be paid to immediately and the balance in his capital account to be transferred to his loan account carrying interest as per the agreement.

(v) Remaining partner decided to maintain equal capital balances, by opening current account .

Prepare the revaluation account and partner's capital accounts. [6]

26] A] On 1st April, 2021, RRR Ltd. was formed with an authorised capital of 20,00,000 divided into 2,00,000 equity shares of ₹10 each. The company issued prospectus inviting applications for 1,50,000 equity shares. The company received applications for 1,40,000 equity shares. During the first year, ₹7 per share were

called. Pushpa holding 4,000 shares and Allu holding 3,000 shares did not pay the first call of ₹2 per share. Allu's shares were forfeited after the first call and later on 1,800 of the forfeited shares re-issued at ₹5 per share, ₹7 paid up. Show the following:

(a) Share Capital in the Balance Sheet of the company as per Schedule III Part I of the Companies Act, 2013.

(b) Also prepare Notes to Accounts for the same.

B] Ciaz Ltd. made the following issue of 9% debentures:

(i) For cash at 110%, 6,000 debentures of ₹100 each.

(ii) 1,400 debentures of ₹100 each to a creditor regarding machinery costing ₹1,20,000.

(iii) To bank for a loan of ₹9,00,000 as collateral security, 10,000 debentures of ₹100 each.

Pass Journal entries for first year only. All capital losses are to be written off in the first year itself. [3+3]

### Part B

#### Analysis of Financial Statements

27] 'Security Deposits' appear in the Balance Sheet of a company under the sub-head [1]

(A) Other Current Liabilities (B) Other Non-Current Assets  
(C) Long-term Loans and Advances (D) Fixed Assets

28] If a Company's Current Liabilities are ₹1,20,000; Working Capital is ₹3,60,000 and Inventory is ₹60,000, its quick ratio will be [1]

(A) 3:1 (B) 3.5:1 (C) 4:1 (D) 4.5:1

OR

9% Debentures ₹1,00,000, Trade Payables ₹4,00,000, Trade Receivables ₹4,00,000, Prepaid Expenses ₹40,000, Inventory ₹5,60,000 and Goodwill is ₹ 2,00,000. Current Ratio will be: [1]

(A) 2:1 (B) 3:1 (C) 2.5:1 (D) 2.4:1

|  |            |
|--|------------|
| Inventory (including Loose tools for 20,000)---    | ₹1,50,000  |
| Trade Receivables----                              | ₹1,00,000  |
| Cash and Cash Equivalents---                       | ₹40,000    |
| Trade Payables ---                                 | ₹30,000    |
| Cost of Revenue from Operations (Cost of Sales)--- | ₹12,80,000 |
| Gross Profit 25% on Cost                           |            |

34] From the following information prepare a Cash flow Statement:

#### BALANCE SHEET as at

| Particulars                               | Note No. | 31-3-2017(₹)    | 31-3-2016(₹)    |
|---|----------|-----------------|-----------------|
| <b>I. EQUITY AND LIABILITIES</b>          |          |                 |                 |
| <b>(1) Shareholders' Funds</b>            |          |                 |                 |
| (a) Share Capital                         | 1        | 1,00,000        | 1,00,000        |
| (b) Reserves and Surplus                  |          | 31,000          | 30,000          |
| <b>(2) Current Liabilities</b>            |          |                 |                 |
| Trade Payables                            |          | 6,200           | 9,200           |
| Short-term Provisions for Taxation        |          | 18,000          | 16,000          |
| <b>Total</b>                              |          | <b>1,55,200</b> | <b>1,55,200</b> |
| <b>II. ASSETS</b>                         |          |                 |                 |
| <b>(1) Non-current Assets</b>             |          |                 |                 |
| Tangible fixed Assets                     |          | 72,000          | 77,000          |
| Intangible Assets (goodwill)              |          | 12,000          | 12,000          |
| Non-current Investments (10% Investments) |          | 11,000          | 10,000          |
| <b>(2) Current Assets</b>                 |          |                 |                 |
| Inventories                               |          | 23,400          | 30,000          |
| Trade Receivables                         |          | 22,200          | 20,000          |
| Provision for Doubtful Debt               |          | (600)           | (400)           |
| Cash & Cash Equivalents                   |          | 15,200          | 6,600           |
| <b>Total</b>                              |          | <b>1,55,200</b> | <b>1,55,200</b> |

#### Note No.

##### 1. Reserves and Surplus

|                   |        |        |
|-------------------|--------|--------|
| General Reserve   | 18,000 | 14,000 |
| Profit & Loss A/c | 13,000 | 16,000 |

Additional Information: Depreciation charges ₹ 8,000. Provision for taxation of ₹19,000 made during the year. [6]