

Total No. of Printed Pages—12

**X/17/S & T**

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**SCIENCE AND TECHNOLOGY**

**( CANDIDATES WITH PRACTICAL/INTERNAL ASSESSMENT )**

*Full Marks : 80*  
*Pass Marks : 24*

**( CANDIDATES WITHOUT PRACTICAL/INTERNAL ASSESSMENT )**

*Full Marks : 100*  
*Pass Marks : 30*

*Time : 3 hours*

( For Both Categories of Candidates )

*The figures in the margin indicate full marks for the questions*

*General Instructions :*

- (i) The question paper comprises of three Sections—A, B and C.
- (ii) The candidates are advised to attempt all the questions of Sections A, B and C separately.
- (iii) Marks allocated to every question are indicated against each.
- (iv) Question Nos. **1** to **39** are to be answered by both Regular and Private Candidates.
- (v) Question No. **40** is to be answered by Private Candidates (without Practicals) only.
- (vi) Regular Candidates should not answer Question No. **40**.

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SECTION—A

( **PHYSICS** )

( Marks : 26 )

Choose and write the correct answers from the following : 1×3=3

**1.** Refraction of light takes place due to the change in its

- (a) speed
- (b) wavelength
- (c) nature
- (d) None of the above

1

**2.** For a young adult with normal vision, the near point is

- (a) 10 cm
- (b) 20 cm
- (c) 25 cm
- (d) 35 cm

1

**3.** In an electric circuit, rheostat is used to change the

- (a) potential difference
- (b) potential
- (c) current
- (d) None of the above

1

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Answer the following questions in one word or one sentence each :

1×3=3

4. State the relation between object distance( $u$ ), image distance( $v$ ) and focal length( $f$ ) of a mirror. 1
5. What is meant by dispersion of light? 1
6. What is 'rating of a fuse'? 1

Answer the following short-answer type questions in 30–40 words each :

2×3=6

7. *Either*

- (a) State the laws of reflection of light. 2

*Or*

- (b) The radius of curvature of a spherical mirror is 20 cm. What is its focal length? 2

8. Write any two advantages of alternating current over direct current. 2
9. Define one volt. Name the instruments used to measure (a) electric current and (b) potential difference in a circuit.

1+ $\frac{1}{2}$ + $\frac{1}{2}$ =2

Answer the following short-answer type questions in 50–60 words each :

3×3=9

10. (a) Define the following terms : 1+1=2
- (i) Power of accommodation
- (ii) Least distance of distinct vision
- (b) Which defect of vision can be corrected by using (i) concave lens and (ii) convex lens?  $\frac{1}{2}$ + $\frac{1}{2}$ =1

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11. (a) Define one kilowatt-hour. 1

(b) An electric toaster has a resistance of 50  $\Omega$  and draws a current of 5 A. Calculate the power consumed. 2

12. *Either*

(a) Without touching, how will you distinguish between plane, concave and convex mirrors? 3

*Or*

(b) Give three reasons as to why nichrome wire is generally used as heating element in heating appliances. 3

Answer the following long-answer type question in 70–80 words : 5

13. *Either*

(a) State Ohm's law. Write the mathematical expression of the law. 1+1=2

(b) How does a solenoid carrying current behave like a bar magnet? 2

(c) Define the resistance of a conductor. 1

*Or*

(d) Define one diopetre. 1

(e) Mention any two uses of concave mirror. 2

(f) Light enters from air to glass having refractive index 1.50. What is the speed of light in glass? The speed of light in vacuum is  $3 \times 10^8$  m/s. 2

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SECTION—B  
( CHEMISTRY )

( Marks : 26 )

Choose and write the correct answers from the following : 1×3=3

**14.** Which of the following metals forms an amphoteric oxide? 1

(a) Potassium

(b) Zinc

(c) Calcium

(d) Copper

**15.** The elements on the right side of the periodic table are

(a) transition metals

(b) non-metals

(c) metals

(d) semi-metals 1

**16.** The organic compounds containing —COOH are called

(a) esters

(b) carboxylic acid

(c) alcohols

(d) aldehyde 1

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Answer the following questions in one word or one sentence each :

1×2=2

**17.** Define the term 'mineral'. 1

**18.** What is meant by functional group? 1

Answer the following short-answer type questions in 30–40 words each :

2×2=4

**19.** What are alcohols? Give the common names of methanoic acid and ethanoic acid. 1+1=2

**20.** *Either*

(a) What is a decomposition reaction? Give an example. [Write the chemical reaction involved.] 1+1=2

*Or*

(b) Define corrosion. Mention two methods used for the prevention of corrosion. 2

Answer the following short-answer type questions in 50–60 words each :

3×4=12

**21.** (a) How is bleaching powder prepared? Give the chemical equation involved. 2

(b) State the modern periodic law. 1

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22. (a) Distinguish between roasting and calcination. (Mention any *two* points.) 2

(b) What chemical process is used for obtaining a metal from its oxide? 1

23. (a) What is soap? 1

(b) Write any two uses of ethanol. 2

24. *Either*

(a) Define the term pH. Mention two applications of pH. 1+2=3

*Or*

(b) What do you mean by valence shell? 1

(c) Write the electronic configuration and find the valency of magnesium with atomic number 12 and sulphur with atomic number 16. 1+1=2

Answer the following long-answer type question in 70–80 words : 5

25. *Either*

(a) What is esterification? Write a chemical equation showing the esterification of ethanol. 2

(b) What is meant by electron affinity? What are the factors that determine the magnitude of electron affinity? (Mention any *two* points.) 1+½+½=2

(c) Define efflorescence. 1

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*Or*

(d) What would you observe when zinc is added to a solution of iron (II) sulphate? Write the chemical reaction that takes place.

2

(e) Give reasons why platinum, gold and silver are used to make jewellery.

3



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SECTION—C

( **BIOLOGY** )

( Marks : 28 )

Choose and write the correct answers from the following : 1×3=3

**26.** Glomerulus and Bowman's capsule constitute

- (a) blood vessels
- (b) Malpighian body
- (c) green gland
- (d) Malpighian tubule 1

**27.** Pollen sacs are present in

- (a) thalamus
- (b) anther
- (c) ovary
- (d) corolla 1

**28.** Lungs are covered by

- (a) pericardium
- (b) perichondrium
- (c) periosteum
- (d) pleura 1

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Answer the following questions in one word or one sentence each :

1×3=3

**29.** Name two important lymphatic organs of the body.  $\frac{1}{2}+\frac{1}{2}=1$

**30.** Name the functional units of lungs and nervous system.  $\frac{1}{2}+\frac{1}{2}=1$

**31.** Define dialysis. 1

Answer the following short-answer type questions in 20–30 words each :

2×4=8

**32.** State Mendel's law of dominance. 2

**33.** Differentiate between phototropism and hydrotropism. 1+1=2

**34.** *Either*

(a) Name the four great blood vessels of the heart.  $\frac{1}{2}\times 4=2$

*Or*

(b) State any two functions of plant hormones. 2

**35.** What are genes? Where are they located? 1+1=2

Answer the following short-answer type questions in 50–60 words each :

3×3=9

**36.** (a) Define respiration. 1

(b) Why is ATP considered as the energy currency of the cell? 2

37.

*Either*

- (a) Mention any three modes of transmission of HIV. 3

*Or*

- (b) What is the role of the following in the digestion of food? 1+1+1=3

- (i) Pepsin  
(ii) Lipase  
(iii) Maltose

38. Write three differences between arteries and veins. 3

Answer the following long-answer type question in 70–80 words : 5

39.

*Either*

- (a) What are the basic features of asexual reproduction?  
(Mention any *five* points.) 5

*Or*

- (b) Describe the digestive functions of saliva.  
(Mention any *five* points.) 5

**[ For Private Candidates (without Practicals) only ]**

40. I. Answer any *three* of the following questions : 2×3=6

- (a) Define 'refraction' of light. 2  
(b) Distinguish between regular and irregular reflection of light. 2  
(c) What is a solenoid? 2  
(d) What is hypermetropia? How can it be corrected? 1+1=2  
(e) Distinguish between concave and convex mirrors.  
(Mention any *two* points.) 2

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II. Answer any *three* of the following questions : 2×3=6

- (a) Give two uses of sodium carbonate. 2
- (b) Define acid and base according to Arrhenius concept. 2
- (c) Give an example of a metal which is (i) liquid at room temperature and (ii) poor conductor of heat. 1+1=2
- (d) Write any two uses of bleaching powder. 2
- (e) What is an oxidizing agent? Give two examples. 1+½+½=2

III. Answer any *four* of the following questions : 2×4=8

- (a) What is nutrition? Name the two main modes of nutrition. 1+½+½=2
- (b) Differentiate between genotype and phenotype. 1+1=2
- (c) List the organs involved in the human urinary system. ½×4=2
- (d) Name the following : 1+1=2
  - (i) Fission in which two organisms are formed from one parent cell
  - (ii) Female reproductive whorl of the flower
- (e) State any two functions of blood. 2
- (f) Differentiate between stock and scion. 1+1=2

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