X/19/S & T (O)

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SCIENCE AND TECHNOLOGY

(Old Course)

(COMPARTMENTAL/IMPROVEMENTAL CANDIDATES WITH PRACTICAL/INTERNAL ASSESSMENT)

Full Marks : 80
Pass Marks : 24

(NON-REGULAR, PRIVATE AND COMPARTMENTAL WITHOUT PRACTICAL/INTERNAL ASSESSMENT)

Full Marks : 100
Pass Marks : 30

Time : 3 hours

The figures in the margin indicate full marks for the questions

General Instructions :

 (i) The candidates are advised to attempt all questions accordingly.

 (ii) Marks allocated to every question are indicated against each.

 (iii) Question Nos. **1** to **39** are to be answered by **Compartmental/ Improvemental Candidates with Internal marks**.

 (iv) Question Nos. **1** to **40** are to be answered by **Compartmental Candidates without Internal marks/Non-regular/Private Candidates**.

[P.T.O.

(2)

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. A fuse is always connected with the electrical circuit

   (a) in parallel

   (b) in series

   (c) Both in series and parallel

   (d) None of the above 1

3. The core of an electromagnet is

   (a) steel

   (b) magnesium

   (c) soft iron

   (d) copper 1

(3)

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

1×3=3

4. What is the speed of light in air?   1

5. Which will offer more resistance—a short wire or a long wire?   1

6. What is a magnetic field?   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) What are the two possible causes of myopia?   1+1=2

8. Write any two advantages of alternating current over direct current.   1+1=2

9. Why are two magnetic lines of force never found to intersect each other?   2

Answer the following short-answer type questions in *50–60* words each :   3×3=9

10. *(a)* What is the formula for a lens connecting image distance v, object distance u and focal length f ?   1

  (b) Define one dioptre. Name the instrument used for measuring the power of a lens.   1+1=2

11. *(a)* Define electric current. 1

(b) 30 coulombs of charge flows through any cross-section of a conductor in 20 seconds. What is the current flowing through the conductor? 2

12. *Either*

(a) Distinguish between real image and virtual image. 3

Or

(b) Derive the relationship between SI unit of electrical energy and commercial unit of electrical energy. 3

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

13. *Either*

(a) State Ohm's law. 2

(b) State the mathematical expression to verify the law. 1

(c) An electric heater draws a current of 11 A, when connected to 220 V main supply. Calculate the resistance of the filament of the heater. 2

Or

(d) Define power of accommodation. 1

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

(f) What is the nature of the lens, if the power of the lens is *(i)* positive and *(ii)* negative? 2

SECTION—B

(CHEMISTRY)

(*Marks* : 26)

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

14. The metal which can be cut with a knife is   1

  (a) sodium

  (b) iron

  (c) lithium

  (d) caesium

15. Which of the following is a strong acid?   1

  (a) CH_3COOH

  (b) H_3PO_4

  (c) H_2CO_3

  (d) HCl

16. The number of periods in the periodic table is   1

  (a) 6

  (b) 7

  (c) 10

  (d) 8

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

1×2=2

17. Define an acid according to Brönsted-Lowry concept. 1

18. What is metallurgy? 1

Answer the following short-answer type questions in *30–40* words each : 2×2=4

19. Define corrosion. Name two methods used for the prevention of corrosion. 1+½+½=2

20. *Either*

(a) What are normal salts? Give two examples. 1+½+½=2

Or

(b) How is bleaching powder prepared? Give the chemical equation. 1+1=2

Answer the following short-answer type questions in *50–60* words each : 3×4=12

21. (a) What do you mean by combination reaction? Give an example. 1+1=2

(b) Why do gold and silver not corrode in moist air? 1

22. (a) What happens when iron reacts with steam? Give the equation. 1+1=2
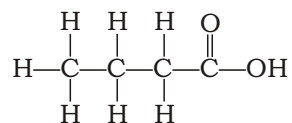
(b) State modern periodic law. 1

23. Differentiate between the roasting and calcination processes used in metallurgy. Give one example of each.   2+½+½=3

24.   *Either*

   (a) What is a functional group in an organic compound?   1

   (b) What are carboxylic acids? What happens when ethanoic acid reacts with ethyl alcohol?   1+1=2

                                         Or

   (c) Name two crystalline allotropes of carbon.   ½+½=1

   (d) What are isomers?   1

   (e) Write the IUPAC name of the following compound :   1

$$H-\overset{\overset{\displaystyle H}{|}}{\underset{\underset{\displaystyle H}{|}}{C}}-\overset{\overset{\displaystyle H}{|}}{\underset{\underset{\displaystyle H}{|}}{C}}-\overset{\overset{\displaystyle H}{|}}{\underset{\underset{\displaystyle H}{|}}{C}}-\overset{\overset{\displaystyle O}{\|}}{C}-OH$$

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

25.   *Either*

   (a) What is flux? What chemical process is used for obtaining a metal from its oxide?   1+1=2

   (b) Describe the process of froth flotation.   3

                                         Or

   (c) What are soaps?   1

   (d) Name the raw materials used for making soap.   2

   (e) How is transparent soap prepared from soft soap?   2

(8)

SECTION—C

(BIOLOGY)

(*Marks* : 28)

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

26. The mode of nutrition in fungi (mushroom) is called

   (a) autotrophic

   (b) holozoic

   (c) heterotrophic

   (d) saprophytic   1

27. The lungs are covered by a membrane called

   (a) pericardium

   (b) pleura

   (c) myelin sheath

   (d) periosteum   1

28. Which of the following is not a plant hormone?

   (a) Gibberellin

   (b) Oxytocin

   (c) Ethylene

   (d) Cytokinin   1

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

1×3=3

29. Name the enzyme present in saliva of human beings.　　　1

30. How do insects and fishes respire?　　　½+½=1

31. What is gene?　　　1

Answer the following short-answer type questions in *20–30* words each :　　　2×4=8

32. What are the factors that affect the rate of photosynthesis?　　2

33. What is blood pressure? Name the instrument used to measure blood pressure.　　　1+1=2

34. 　　　　　　　*Either*

    (a) Name three types of blood corpuscles present in the human blood.　　　1½

    (b) Which fluid transports fatty acids and glycerol in the human body?　　　½

　　　　　　　Or

    (c) Name any four sense organs for receptor.　　　½×4=2

35. Mention any two basic features of asexual reproduction.　　　2

Answer the following short-answer type questions in *50–60* words each :   3×3=9

36. What are vestigial organs? Name four vestigial organs.   1+2=3

37.   *Either*

    (a) What are the four great blood vessels of the heart?   2

    (b) What is the respiratory pigment present in erythrocytes?   1

Or

    (c) Give any three important characteristics of hormone.   3

38. *(a)* What is tissue culture?   1

    (b) Distinguish between binary and multiple fission.   2

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

39.   *Either*

    (a) Write any five main functions of human blood.   5

Or

    (b) What are the functions of saliva?   5

(**11**)

[For Candidates (without Practicals) only]

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

(a) What do you mean by magnification of spherical mirror? 2

(b) What is dispersion of light? Which colour bends the most? 1+1=2

(c) What are insulators? Give two examples. 1+1=2

(d) (i) What is meant by magnetic effect of current? 1

(ii) How does a conductor behave when electric current flows through it? 1

(e) Name the instruments used to measure current and potential difference. 1+1=2

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

(a) Define the terms (i) oxidation and (ii) reduction. 1+1=2

(b) (i) Name the simplest hydrocarbon. 1

(ii) Give the general formula of alkanes. 1

(c) (i) Name the non-metal which is good conductor of electricity. 1

(ii) What is an alloy? 1

(d) Mention any two applications of pH. 2

(e) What are malleability and ductility? 1+1=2

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

(a) Name the four chambers of human heart.   ½×4=2

(b) Name the accessory whorls and the reproductive whorls of a flower.   ½×4=2

(c) Define transpiration. Name the plant tissue concerned with transport of water and food materials.
    1+1=2

(d) *(i)* What is ultrafiltration?   1

  (ii) Name the main excretory organs in human beings.   1

(e) Name the different parts of central nervous system of the human body.   2

(f) How does vegetative reproduction occur in colocacia, chrysanthemum, onion and strawberry?   ½×4=2

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