Sample Paper 5

Time : 90 Minutes **Max. Marks : 50**

General Instructions

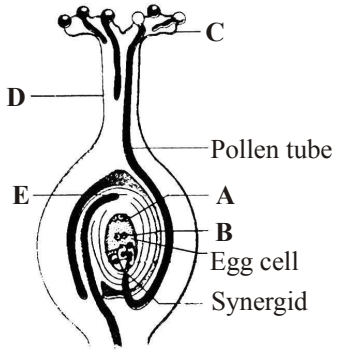
1. *The Question Paper contains three sections.*
2. ***Section A** has **24** questions. Attempt any **20** questions.*
3. ***Section B** has **24** questions. Attempt any **20** questions.*
4. ***Section C** has **12** questions. Attempt any **10** questions.*
5. *All questions carry equal marks.*
6. *There is no negative marking*

SECTION-A

DIRECTION: *This section consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.*

1. How many meiotic division are required for the formation of 100 functional megaspores?
(a) 100 (b) 50 (c) 75 (d) 25

2. The given figure represent the L.S of a flower showing growth of pollen tube. Few structures are marked as A, B, C, D & E. Identify A, B, C, D and E respectively.

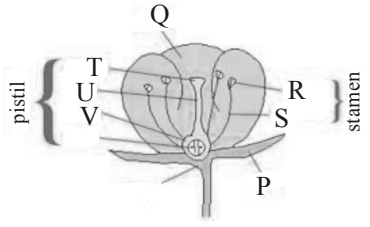


(a) Antipodal cells, Polar nuclei, Stigma, Style, Chalaza
(b) Antipodal cells, Polar nuclei, Style, Stigma, Chalaza
(c) Antipodal cells, Polar nuclei, Stigma, Chalaza, Style
(d) Antipodal cells, Polar nuclei, Chalaza, Stigma, Style

3. _____ of the pollen grain divides to form two male gametes.
(a) Vegetative cell (b) Generative cell
(c) Microspore mother cell (d) None of these

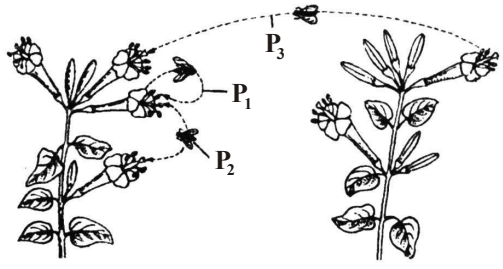
4. By the end of how many weeks, major organ system are formed during the embryonic development?
(a) 4 weeks (b) 8 weeks
(c) 12 weeks (d) 24 weeks

5. Identify P - V in the given figure and select the correct option.



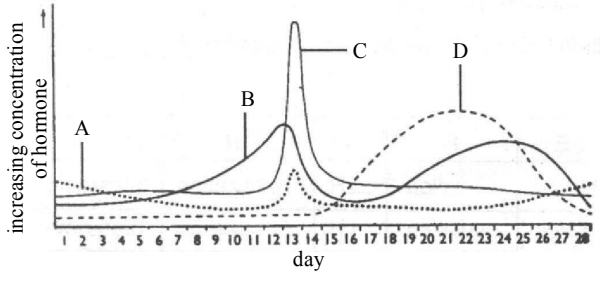
(a) P-Petal, Q-sepal, R-Filament, S-Anther, T-Style, U-Stigma, V-Ovary
(b) P-Petal, Q-Sepal, R-Anther, S-Filament, T-Stigma, U-Style, V-Ovary
(c) P-Sepal, Q-Petal, R-Anther, S-Filament, T-Stigma, U-Style, V-Ovary
(d) P-Ovary, Q-Petal, R-Anther, S-Filament, T-Stigma; U-Style, V-Sepal

6. The given diagram shows two plants of the same species. Identify the type of pollination indicated as P_1, P_2 and P_3.



	P_1	P_2	P_3
(a)	Allogamy	Chasmogamy	Cleistogamy
(b)	Autogamy	Xenogamy	Geitonogamy
(c)	Autogamy	Geitonogamy	Xenogamy
(d)	Geitonogamy	Allogamy	Autogamy

7. The following graph represents the relative concentrations of the four hormones (A, B, C and D) present in the blood plasma of a woman during her menstrual cycle. Identify the hormones.

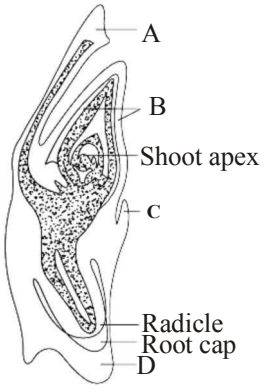


	A	B	C	D
(a)	FSH	Progesterone	LH	Oestrogen
(b)	LH	Progesterone	FSH	Oestrogen
(c)	FSH	Oestrogen	LH	Progesterone
(d)	LH	Oestrogen	FSH	Progesterone

8. In human females, meiosis-II is not complete until?
(a) fertilization (b) uterine implantation (c) birth (d) puberty

9. The vas deferens receives duct from the seminal vesicle and opens into urethra as
(a) epididymis (b) ejaculatory duct (c) efferent ductule (d) ureter

10. The given figure shows the L.S. of a monocot embryo. Choose the correct labelling for A, B, C and D marked in the figure from the options given below.



(a) A – Coleoptile; B – Scutellum; C – Epiblast; D – Coleorhiza
(b) A – Scutellum; B – Coleoptile; C – Coleorhiza; D – Epiblast
(c) A – Scutellum; B – Epiblast; C – Coleoptile; D – Coleorhiza
(d) A – Scutellum; B – Coleoptile; C – Epiblast; D – Coleorhiza

11. The total number of nuclei involved in double fertilization in angiosperms are
(a) two (b) three (c) four (d) five

12. Mutations can be induced with
(a) infrared radiations (b) IAA (c) ethylene (d) gamma radiations

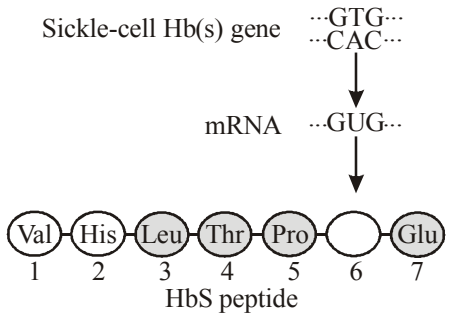
13. Which of the following statements are correct?
(i) r-RNA provides the template for synthesis of proteins.
(ii) t-RNA brings amino acids and reads the genetic code.
(iii) RNA polymerase binds to promoter and initiates transcription.
(iv) A segment of DNA coding for polypeptide is called intron.
(a) (i) and (iii) (b) (i) and (ii) (c) (i), (ii) and (iii) (d) (ii) and (iii)

14. Which one of the following group of codons is called as degenerate codons?
(a) UAA, UAG and UGA
(b) GUA, GUG, GCA, GCG and GAA
(c) UUC, UUG, CCU, CAA and CUG
(d) UUA, UUG, CUU, CUC, CUA and CUG

15. Which step of translation does not consume high energy phosphate bond?
(a) Translocation
(b) Peptidyl transferase reaction
(c) Amino acid activation
(d) Aminoacyl tRNA binding to A-site

16. In *Escherichia coli*, *lac* operon is induced by
(a) lactose (b) promotor gene (c) β-galactosidase (d) I-gene

17. In sickle cell anaemia glutamic acid is replaced by valine. Which one of the following triplet codes for valine?

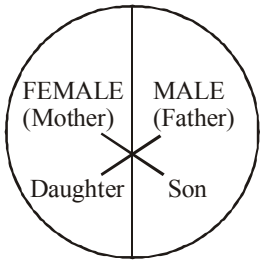


(a) GGG (b) AAG (c) GAA (d) GUG

18. The **Mirabilis jalapa** when two F1 pink flowered plants were crossed with each other, the F2 generation produced 40 red, 80 pink and 40 white flowering plants. This is a case of
(a) duplicate genes (b) lethal genes (c) incomplete dominance (d) epistasis

19. Mental retardation in man associated with sex chromosomal abnormality is usually due to
(a) increase in size of X-chromosome. (b) increase in size of Y-chromosome.
(c) increase in number of Y-chromosome. (d) increase in number of X-chromosome.

20. The given figure represents the inheritance pattern of a certain type of traits in humans.



Which one of the following conditions could be an example of this pattern?
(a) Thalassemia (b) Haemophilia (c) Phenylketonuria (d) Sickle cell anaemia

21. Which one of the following correctly represents the nature of blood in the ABO system of blood groups pertaining to the presence of antigens and antibodies?
(a) Blood group A –Antibody A and antigen B
(b) Blood group B–Antigen B and antibody A
(c) Blood group AB–Both antibodies A and B
(d) Blood group O–No antigens and no antibodies

22. Crossing over in diploid organisms is responsible for
(a) dominance of genes (b) linkage between genes
(c) recombination of linked genes (d) segregation of alleles

23. In a certain taxon of insects some have 17 chromosomes and the others have 18 chromosomes. The 17 and 18 chromosome-bearing organisms are
(a) males and females respectively (b) females and males, respectively
(c) all males (d) all females

24. A tobacco plant heterozygous for albinism (a recessive character) is self-pollinated and 1200 seeds are subsequently germinated. How many seedings would have the parental genotype?
(a) 1250 (b) 600 (c) 300 (d) 2250

SECTION-B

DIRECTION: *This section consists of 24 questions (Sl. No.25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.*

Question No. 25 to 28: *Consist of two statements Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:*

(a) If both Assertion and Reason are True and the Reason is a correct explanation of the Assertion.
(b) If both Assertion and Reason are True but Reason is not a correct explanation of the Assertion.
(c) If the Assertion is True but Reason is False.
(d) If both Assertion and Reason are False.

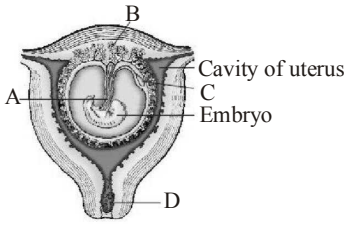
25. **Assertion:** India was amongst the first countries in the world to initiate action plants and programmes at a national level to attain total reproductive health as a social goal.
Reason: The family planing programmes were initiated in 1991.

26. **Assertion:** Saheli is a new oral contraceptive for the females contains a non-steroidal preparation.
Reason: Saheli is a daily pill with many side effects and low contraceptive value.

27. **Assertion:** Deletion and insertion of base pairs of DNA, cause frame-shift mutation.
Reason: Sickle cell anaemia is a classic example of frame-shift mutations.

28. **Assetion:** Implantation occurs on 7th day after the fertilisation.
Reason: Fertilisation guarantees the establishment of pregnancy.

29. The given figure shows the human foetus within the uterus with few structures marked as A, B, C and D.



Which of the following options shows the correct labeling?

(a) A→Umbilical cord with its veins, B→ Chorionic villi, C→Antrum, D→Plug of mucus in cervix
(b) A→Umbilical cord with its vessels, B→Fimbriae, C→ Oocyte, D→Plug of mucus in vagina
(c) A→Umbilical cord with its vessels, B→Placental villi, C→Yolk sac, D→Plug of mucus in cervix
(d) A→Umbilical cord with its veins, B→Placental villi, C→Trophoblast, D→Plug of mucus in vagina

30. Pollen grains are preserved as fossils because of the

(a) Presence of cellulose & pectin (b) Presence of sporopollenin
(c) Presence of lignin (d) Presence of cellulose

31. For artificial hybridization experiment in bisexual flower, which of the following sequences is correct?

(a) Bagging → Emasculation → Cross-pollination → Rebagging
(b) Emasculation → Bagging → Cross-pollination → Rebagging
(c) Cross-pollination → Bagging → Emasculation → Rebagging
(d) Self-pollination → Bagging → Emasculation → Rebagging

32. If for some reason, the vasa efferentia in the human reproductive system get blocked, the gametes will not be transported from

(a) testes to epididymis (b) epididymis to vas deferens
(c) ovary to uterus (d) vagina to uterus

33. Which of the following STDs are not completely curable?

(a) Chlamydiasis, gonorrhoea, trichomoniasis (b) Chancroid, syphilis, genital warts
(c) AIDS, syphilis, hepatitis B (d) AIDS, genital herpes, hepatitis B

34. Which of the following is traditional method of contraception?

(a) Implantation (b) Lactational amenorrhoea
(c) Condoms (d) Sterilization

35. Three children in a family have blood types O, AB and B respectively. What are the genotypes of their parents?

(a) I^A i and I^Bi (b) I^AI^B and i i (c) I^BI^B and I^AI^A (d) I^AI^A and I^Bi

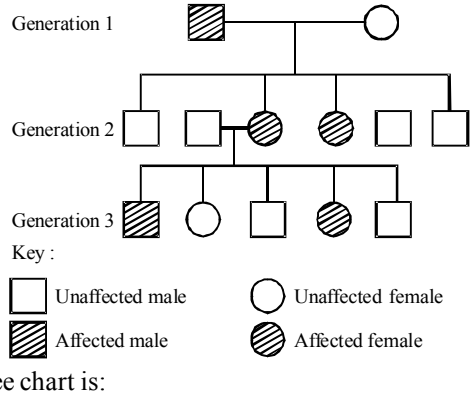
36. What proportion of the offsprings obtained from cross AABBCC × AaBbCc will be completely heterozygous for all genes segregated independently?

(a) 1/8 (b) 1/4 (c) 1/2 (d) 1/16

37. Both sickle cell anaemia and Huntington's chorea are

(a) congenital disorders (b) pollulant-induced disorders
(c) virus-related diseases (d) bacteria - related diseases

38. Given below is a pedigree chart showing the inheritance of a certain sex-linked trait in humans.



The trait traced in the above pedigree chart is:

(a) Dominant X-linked (b) Recessive X-linked
(c) Dominant Y-linked (d) Recessive Y-linked

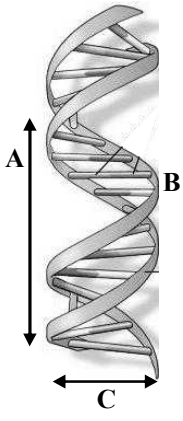
39. Person having genotype $I^A I^B$ would show the blood group as AB. This is because of
(a) Pleiotropy (b) Codominance (c) segregation (d) incomplete dominance

40. ZZ/ZW type of sex determination is seen in
(a) Platypus (b) Snails (c) Cockroach (d) Peacock

41. Clover leaf secondary structure of *t*RNA has a loop for
(a) three nucleotides of a codon. (b) three nucleotides of an anticodon.
(c) no nucleotides. (d) both (a) and (b)

42. Which step of translation does not consume a high energy phosphate bond?
(a) Translocation (b) Amino acid activation
(c) Peptidyl-transferase reaction (d) Aminoacyl tRNA binding to active ribosomal site

43. Given figure represent the DNA double helix model, proposed by Watson and Crick (1953). Select the option that shows correct measurement of A, B and C marked in the figure.



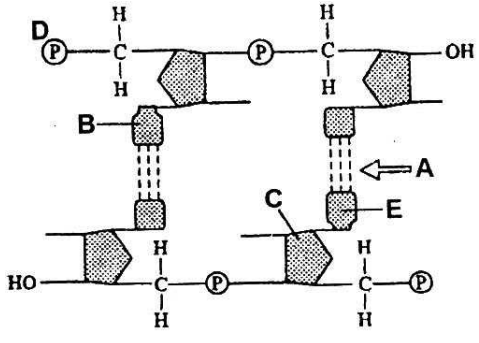
(a) A – 3.4 nm, B – 0.34 nm, C – 2 nm (b) A – 34 nm, B – 3.4 nm, C – 20 nm
(c) A – 3.4 Å, B – 0.34 Å, C – 20 Å (d) A – 34 Å, B – 3.4 Å, C – 2 Å

44. Who proved that DNA is basic genetic material?
(a) Griffith (b) Watson (c) Boveri and Sutton (d) Hershey and Chase

45. Information flow or central dogma of modern biology is
(a) RNA → Proteins → DNA (b) DNA → RNA → RNA
(c) RNA → DNA → Proteins (d) DNA → RNA → Proteins

46. Process used for amplication or multiplication of DNA for finger printing is
(a) polymerse chain reaction (b) nesslerisation
(c) southern blotting (d) northern blotting

47. The given figure represents the double stranded poly-nucteotide chain. Some parts are labelled as A, B, C, D and E. Identify the correct labelling of A, B, C, D & E.



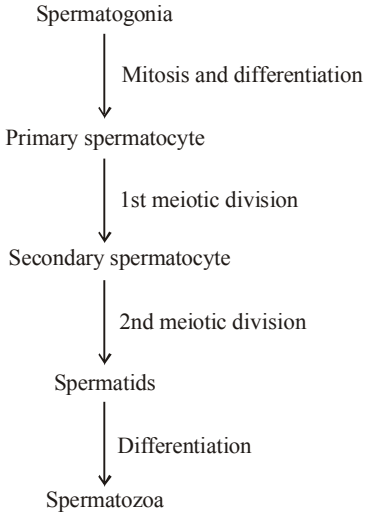
(a) A–Hydrogen bonds, B–Pyrimidine, C–Hexose (deoxyribose) sugar, D–5' end, E–Purine base
(b) A–Hydrogen bonds, B–Purine base, C–Hexose (deoxyribose) sugar, D–5' end, E–Pyrimidine
(c) A–Hydrogen bonds, B–Pyrimidine, C–Pentose (deoxyribose) sugar, D–5' end, E–Purine base
(d) A–Hydrogen bonds, B–Purine base, C–Pentose (deoxyribose) sugar, D– 5' end, E– Pyrimidine

48. In lac operon, structural gene 'Z' synthesises
(a) β-galactosidase (b) galactosidase permease
(c) galactosidase transacetylase (d) None of the above

SECTION-C

DIRECTION: *This section consists of one case followed by 6 questions linked to this case (Q.No.49 to 54). Besides this, 6 more questions are given. Attempt any 10 questions in this section. The first attempted 10 questions would be evaluated.*

Spermatogenesis is the production of sperms from male germ cells (spermatogonia) inside the testes (semniferous tubule). This process begin at puberty.



49. This happens during spermatogenesis
(a) Meiosis (b) Mitosis (c) Meiosis and mitosis (d) None of these

50. The process of spermatogenesis is induced by
(a) TSH (b) FSH (c) MSH (d) ACTH

51. The number of spermatozoa, a single primary spermatocyte finally produced in spermatogenesis is
(a) 2 (b) 4 (c) 6 (d) 8

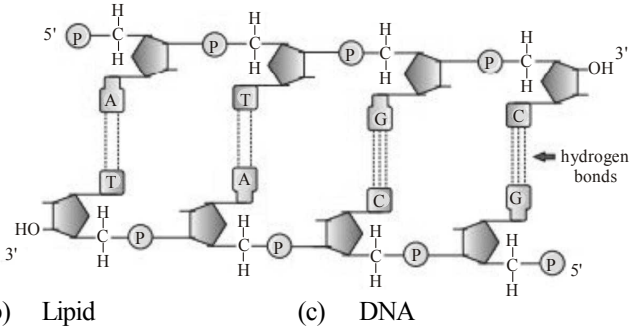
52. In spermatogenesis, the phases of maturation involve
(a) formation of spermatids from primary spermatocyte through meiosis
(b) growth of spermatogonia into primary spermatocytes
(c) formation of spermatogonia from gonocytes through mitosis
(d) formation of oogonia from spermatocyte through meiosis

53. The correct sequence of cell stage in spermatogenesis is
(a) spermatocyte → spermatids → spermatogonia → spermatozoa
(b) spermatogonia → spermatids → spermatocyte → spermatozoa
(c) spermatocytes → spermatogonia → spermatid → spermatozoa
(d) spermatogonia → spermatocytes → spermatids → spermatozoa

54. Which of the following contains a fluid filled cavity called antrum?
(a) Primary spermatocyte (b) Primary follicle of ovary
(c) Tertiary follicle of ovary (d) Secondary spermatocyte

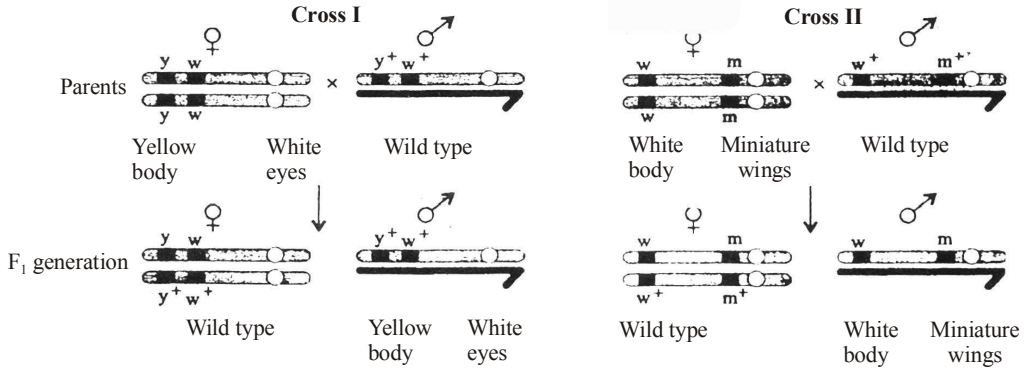
55. The regulation of tryptophan synthesis in *E. coli* is an example of affecting gene expression through
(a) translational control (b) transcriptional control
(c) homeotic gene control (d) breaking down mRNA molecules

56. The given diagram represents the chemical structure of



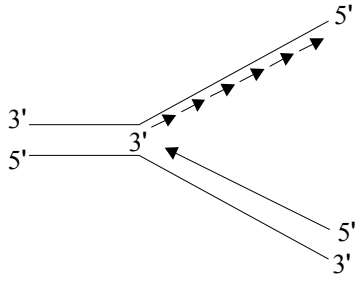
(a) Protein (b) Lipid (c) DNA (d) All of them

57. The experiment shown in the given figure has been carried out by Morgan to show the phenomenon of linkage and recombination. If in cross I, genes are tightly linked and in cross II, genes are loosely linked then what will be the percentage of recombinants produced in cross I and cross II respectively?



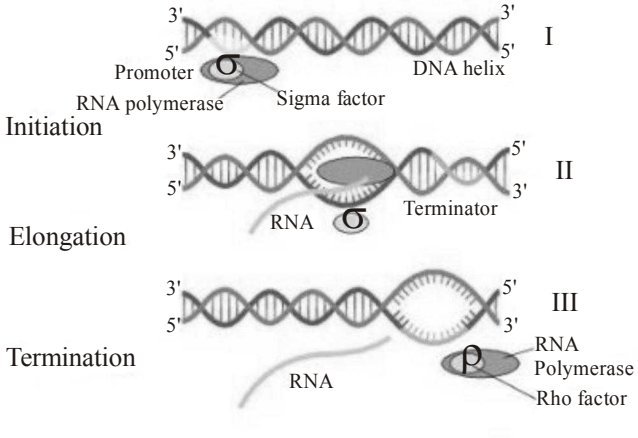
(a) 98.7% and 62.8% (b) 1.3% and 37.2% (c) 37.2 and 1.3% (d) 62.8% and 98.7%

58. What is the error in above diagram?



(a) Arrows are wrongly depicted (b) Polarity is incorrect
(c) Both arrows and polarity are incorrect (d) None of these

59. Which of the above figure shows the elongation process?



(a) Figure I (b) Figure II (c) Figure III (d) None of them

60. Percentage of (G + C) is

(a) $\frac{G+C}{(A+G+T+C)}\times 100$ (b) $\frac{100}{A+T}\times G+C$

(c) $\frac{G+C}{A+T+G+C}$ (d) $\frac{(G+C)\times(A+T)}{100}$

OMR ANSWER SHEET

Sample Paper No – 5

- ✶ Use Blue / Black Ball pen only.
- ✶ Please do not make any atray marks on the answer sheet.
- ✶ Rough work must not be done on the answer sheet.
- ✶ Darken one circle deeply for each question in the OMR Answer sheet, as faintly darkend / half darkened circle might by rejected.

Start time : _____ End time _____ Time taken _____

1. Name (in Block Letters)

2. Date of Exam

3. Candidate's Signature

SECTION-A

1.	a	b	c	d	9.	a	b	c	d	17.	a	b	c	d
2.	a	b	c	d	10.	a	b	c	d	18.	a	b	c	d
3.	a	b	c	d	11.	a	b	c	d	19.	a	b	c	d
4.	a	b	c	d	12.	a	b	c	d	20.	a	b	c	d
5.	a	b	c	d	13.	a	b	c	d	21.	a	b	c	d
6.	a	b	c	d	14.	a	b	c	d	22.	a	b	c	d
7.	a	b	c	d	15.	a	b	c	d	23.	a	b	c	d
8.	a	b	c	d	16.	a	b	c	d	24.	a	b	c	d

SECTION-B

25.	a	b	c	d	33.	a	b	c	d	41.	a	b	c	d
26.	a	b	c	d	34.	a	b	c	d	42.	a	b	c	d
27.	a	b	c	d	35.	a	b	c	d	43.	a	b	c	d
28.	a	b	c	d	36.	a	b	c	d	44.	a	b	c	d
29.	a	b	c	d	37.	a	b	c	d	45.	a	b	c	d
30.	a	b	c	d	38.	a	b	c	d	46.	a	b	c	d
31.	a	b	c	d	39.	a	b	c	d	47.	a	b	c	d
32.	a	b	c	d	40.	a	b	c	d	48.	a	b	c	d

SECTION-C

49.	a	b	c	d	53.	a	b	c	d	57.	a	b	c	d
50.	a	b	c	d	54.	a	b	c	d	58.	a	b	c	d
51.	a	b	c	d	55.	a	b	c	d	59.	a	b	c	d
52.	a	b	c	d	56.	a	b	c	d	60.	a	b	c	d

No. of Qns. Attempted		Correct		Incorrect		Marks	