

# Sample Paper

6

Time : 90 Minutes

Max. Marks : 50

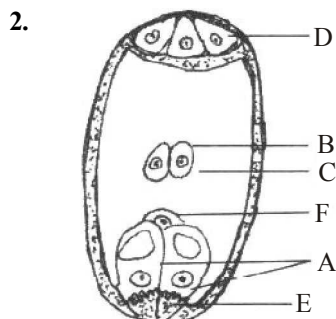
## General Instructions

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

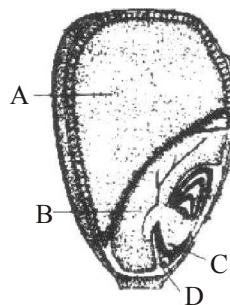
**DIRECTION:** This section consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

1. The type of cells under going meiosis in the flowers are
  - (a) micro spore and mega spore mother cell
  - (b) ovule & stamen
  - (c) tapetal cells
  - (d) placental cell

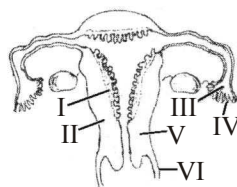


- In the diagram given above, parts labelled as 'A', 'B', 'C', 'D', 'E' and 'F' are respectively identified as:
- (a) synergids, polar nuclei, central cell, antipodals, filiform apparatus and egg
  - (b) polar nuclei, egg, antipodals, central cell, filiform apparatus and synergids
  - (c) egg, synergids, central cell, filiform apparatus, antipodals and polar nuclei
  - (d) central cell, polar nuclei, filiform apparatus, antipodals, synergids and egg
3. Which of the following condition of angiospermic embryo sac is seen at maturity?
    - (a) 7 celled, 8 nucleate
    - (b) 7 celled, 7 nucleate
    - (c) 8 celled, 8 nucleate
    - (d) 8 celled, 7 nucleate
  4. Select the incorrect pair of type of pollination and the corresponding pollinating agency.
    - (a) Anemophily – Wind
    - (b) Hydrophily – Water
    - (c) Ornithophily – Birds
    - (d) Chiropterophily – Insects

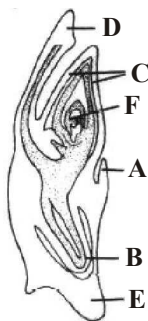
5. The given figure shows L.S of the seed of maize. What do A, B, C and D represent?



- (a) A : endosperm; B : scutellum; C : plumule; D : coleoptile  
 (b) A : scutellum; B : pericarp; C : radicle; D : coleoptile  
 (c) A : endosperm; B : scutellum; C : radicle; D : coleorhiza  
 (d) A : scutellum; B : pericarp; C : plumule; D : coleorhiza
6. Which chemical of the eggs attracts and holds sperm?  
 (a) Fertilizin (b) Antifertilizin (c) Agglutin (d) Antiagglutin
7. The figure given below depicts a diagrammatic sectional view of the female reproductive system of humans. Which one set of three parts out of I-VI have been correctly identified ?

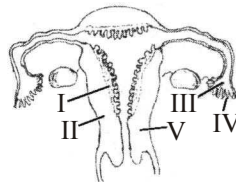


- (a) (II) Endometrium, (III) Infundibulum, (IV) Fimbriae  
 (b) (III) Infundibulum, (IV) Fimbriae, (V) Cervix  
 (c) (IV) Oviducal funnel, (V) Uterus, (VI) Cervix  
 (d) (I) Perimetrium, (II) Myometrium, (III) Fallopian tube
8. Select the incorrect statement :  
 (a) FSH stimulates the sertoli cells which help in spermiogenesis  
 (b) LH triggers ovulation in ovary  
 (c) LH and FSH decrease gradually during the follicular phase  
 (d) LH triggers secretion of androgens from the Leydig cells
9. The main function of mammalian corpus luteum is to produce:  
 (a) estrogen only (b) progesterone  
 (c) human chorionic gonadotropin (d) relaxin only
10. In this diagram showing the L.S. of an embryo of grass, identify the answer having the correct combination of alphabets with the right part.



- (a) A - Epiblast, B - Scutellum, C - Coleoptile, D - Radicle, E - Coleorhiza, F - Shoot apex  
 (b) A - Epiblast, B - Radicle, C - Coleoptile, D - Scutellum, E - Coleorhiza, F - Shoot apex  
 (c) A - Root cap, B - Coleoptile, C - Scutellum, D - Coleorhiza, E - Epiblast, F - Shoot apex  
 (d) A - Shoot apex, B - Epiblast, C - Coleorhiza, D - Scutellum, E - Coleoptile, F - Radicle

11. Generally the pollen grains of monocots are \_\_\_\_\_ and dicots are respectively.  
 (a) uniporate and biporate (b) biporate and trip orate  
 (c) uniporate and triporate (d) triporate and tetraporate
12. 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
13. Which one of the followings is correctly matched with their chromosomal condition?  
 (a) Sickle cell anaemia – Heterozygous condition of Hbs gene  
 (b) Down's syndrome – Trisomy of chromosome 22  
 (c) Turner's syndrome – XO condition  
 (d) Klinefelter's syndrome – failure of cytokinesis after telophase
14. If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is  
 (a) Autosomal dominant (b) autosomal recessive (c) sex-linked dominant (d) sex-linked recessive
15. Cross between two tall plants resulted in offspring having few dwarf plants. What would be the genotypes of both the parents ?  
 (a) TT and Tt (b) Tt and Tt (c) TT and TT (d) Tt and tt
16. In his classic experiments on pea plants, Mendel did not use  
 (a) Pod length (b) Seed shape (c) Flower position (d) Seed colour
17. Down's syndrome in humans is due to  
 (a) Two 'Y' chromosomes (b) Three 'X' chromosomes  
 (c) Three copies of chromosome 21 (d) Monosomy
18. Lactose operon produces enzymes  
 (a)  $\beta$ -galactosidase, permease and glycogen synthetase.  
 (b)  $\beta$ -galactosidase, permease and transacetylase.  
 (c) Permease, glycogen synthetase and transacetylase.  
 (d)  $\beta$ -galactosidase, permease and phosphoglucose isomerase.
19. Genes that are involved in turning on or off the transcription of a set of structural genes are called  
 (a) Operator genes (b) Redundant genes (c) Regulator genes (d) Polymorphic genes
20. Reverse transcriptase is  
 (a) RNA dependent RNA polymerase (b) DNA dependent RNA polymerase  
 (c) DNA dependent DNA polymerase (d) RNA dependent DNA polymerase
21. One gene-one enzyme relationship was established for the first time in  
 (a) *Salmonella typhimurium* (b) *Escherichia coli*  
 (c) *Diplococcus pneumoniae* (d) *Neurospora crassa*
22. In the DNA molecule  
 (a) the total amount of purine nucleotides and pyrimidine nucleotides is not always equal  
 (b) there are two strands which run parallel in the  $5' \rightarrow 3'$  direction  
 (c) the proportion of adenine in relation to thymine varies with the organism  
 (d) there are two strands which run anti-parallel one in  $5' \rightarrow 3'$  direction and other in  $3' \rightarrow 5'$
23. The figure given below depicts a diagrammatic sectional view of all female reproductive system of humans. Which of the following option represent III, IV and V part?



- (a) (I) Perimetrium, (II) Myometrium, (III) Fallopian tube  
 (b) (II) Endometrium, (III) Infundibulum, (IV) Fimbriae  
 (c) (III) Infundibulum, (IV) Fimbriae, (V) Cervix  
 (d) (IV) Oviducal funnel, (V) Uterus
24. In a DNA strand the nucleotides are linked together by  
 (a) glycosidic bonds (b) phosphodiester bonds (c) peptide bonds (d) hydrogen bonds

## 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.

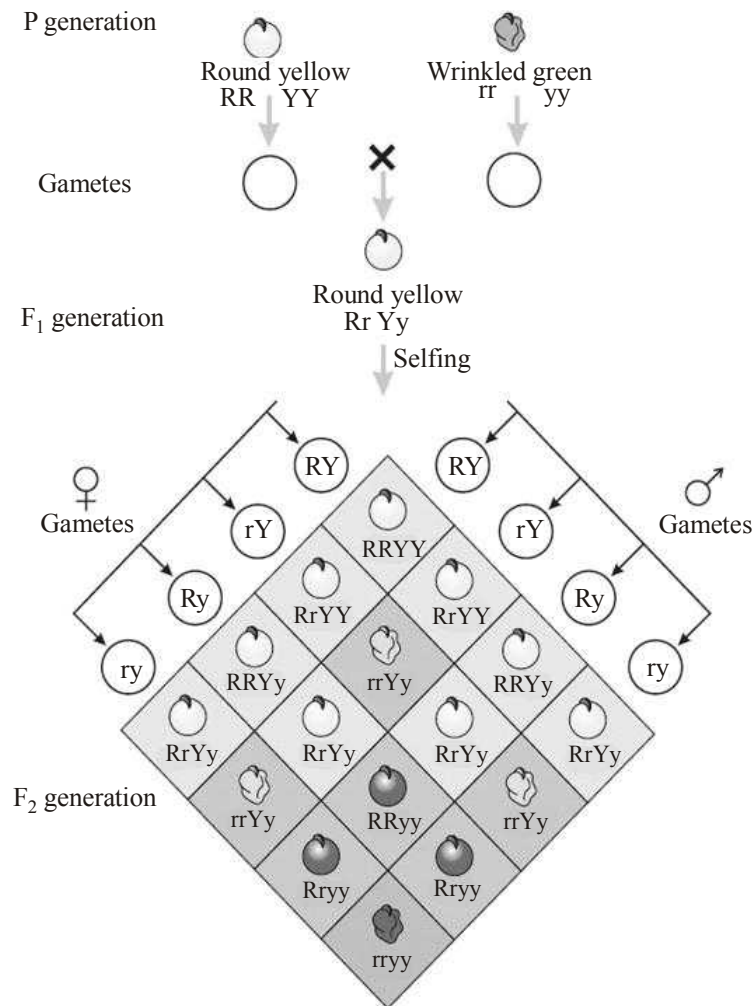
**Question No. 25 to 28:** Consist of two statements Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (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:** In very rare cases, a surrogate mother may have to be used to bring up in vitro fertilised ovum to maturity.  
**Reason:** Success rate of test tube baby is more than 90%.
26. **Assertion:** The Mendalian factors are also called unit factor which are known as genes.  
**Reason:** Chemically, a gene is a linear segment of DNA called cistron.
27. **Assertion:** The flower colour of sweet pea shows the inheritance of complementary genes.  
**Reason:** The ratio obtained for complementary genes is 9:7.
28. **Assertion:** Mendel was born on 22nd July, 1822 to a farmers family in the Austria.  
**Reason:** Mendel died due to heart attack in the year 1901.
29. The given diagram refers to T.S. of testis showing sectionl view of a few semniferous tubules. Identify the parts labelled A-D and select the correct option.



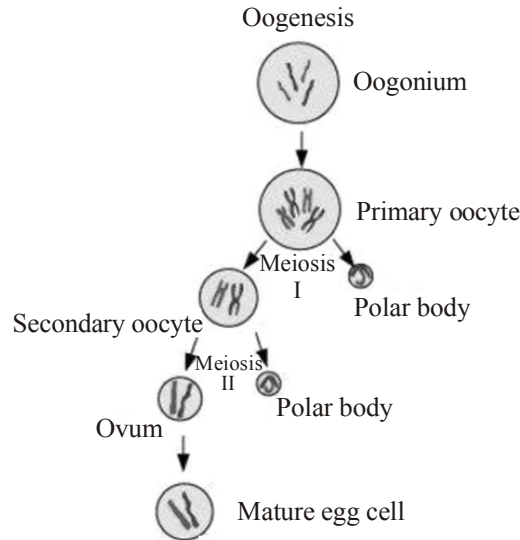
- (a) A-Sertoli cell, B-Spermatozoa, C -Interstitial cell, D-Sperms  
 (b) A-Sertoli cell, B-Secondary spermatocyte, C -Interstitial cell, D-Sperms  
 (c) A-Interstitial cell, B-Spermatogonia, C -Sertoli cells, D-Sperms  
 (d) A-Sertoli cells, B-Spermatogonia, C -Interstitial cells, D-Sperms
30. The main function of the fimbriae of the Fallopian tube in females is to  
 (a) release to ovum from the Graafian follicle  
 (b) make necessary changes in the endometrium for implantation  
 (c) help in the development of corpus luteum  
 (d) help in the collection of the ovum after ovulation
31. A particular species of plant produces light, non-sticky pollen in large numbers and its stigmas are long and feathery. These modifications facilitate pollination by  
 (a) insects (b) water (c) wind (d) animals
32. At the time of fertilization sperm head enters in the egg from  
 (a) Any where (b) Animal pole  
 (c) Vegetal pole (d) Lateral side of egg
33. Copper-T is a device that prevents  
 (a) implantation of blastocyst & fertilization  
 (b) ovulation  
 (c) decrease phagocytosis of sperm  
 (d) egg maturation
34. The diaphragm, cervical cap and vaults are  
 (a) disposable contraceptive devices (b) reusable contraceptives  
 (c) IUDs (d) Implants

35. The point at which funiculus touches the ovule is  
 (a) chalaza (b) hilum (c) raphe (d) endothelium
36. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offsprings?  
 (a) A, B and AB only (b) A, B, AB and O (c) O only (d) A and B only
37. Which of the following characteristics represent 'Inheritance of blood groups' in humans?  
 A. Dominance B. Co-dominance  
 C. Multiple allele D. Incomplete dominance  
 E. Polygenic inheritance  
 (a) B, C and E (b) A, B and C (c) A, C and E (d) B, D and E
38. When two unrelated individuals or lines are crossed, the performance of F<sub>1</sub> hybrid is often superior to both parents. This phenomenon is called:  
 (a) heterosis (b) transformation (c) splicing (d) metamorphosis
39. In a dihybrid cross, if you get 9 : 3 : 3 : 1 ratio it denotes that



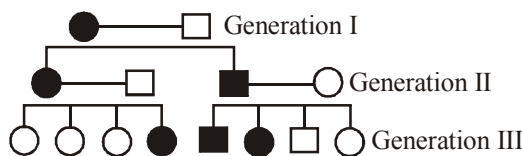
- (a) the alleles of two genes are interacting with each other.  
 (b) it is a multigenic inheritance.  
 (c) it is a case of multiple allelism.  
 (d) the alleles of two genes are segregating independently.
40. In our society women are blamed for producing female children. Choose the correct answer for the sex-determination in humans  
 (a) Due to some defect in the women  
 (b) Due to some defect like aspermia in man  
 (c) Due to the genetic make up of the particular sperm which fertilizes the egg  
 (d) Due to the genetic make up of the egg

41. Which of the following is sex linked disorder ?  
 (a) Sickle-cell anaemia (b) Albinism (c) Haemophilia (d) Phenylketonuria
42. In prokaryotes, gene regulation occurs at the level of  
 (a) transcription (b) translation (c) post-transcription (d) post-translation
43. Telomerase is an enzyme which is a  
 (a) simple protein (b) RNA (c) ribonucleoprotein (d) repetitive DNA
44. During oogenesis, each diploid cell produces:



Process of oogenesis

- (a) Four functional eggs  
 (b) Two functional eggs and two polar bodies  
 (c) One functional eggs and three polar bodies  
 (d) Four functional bodies.
45. Mendel's rules do not correctly predict patterns of inheritance for tightly linked genes or the inheritance of alleles that show incomplete dominance or epistasis. Does this mean that his hypothesis are incorrect ?  
 (a) Yes, because they are relevant to only a small number of organisms and traits.  
 (b) Yes, because not all data support his hypothesis.  
 (c) No, because he was not aware of meiosis or the chromosome theory of inheritance.  
 (d) No, it just means that his hypothesis are limited to certain conditions.
46. Termination of polypeptide chain is brought about by  
 (a) UUG, UAG and UCG (b) UAA, UAG and UGA  
 (c) UUG, UGC and UCA (d) UCG, GCG and ACC
47. Nucleotide arrangement in DNA can be seen by  
 (a) X-ray crystallography (b) electron microscope  
 (c) ultracentrifuge (d) light microscope
48. A pedigree is shown below for a disease that is autosomal dominant. The genetic made up of the first generation is

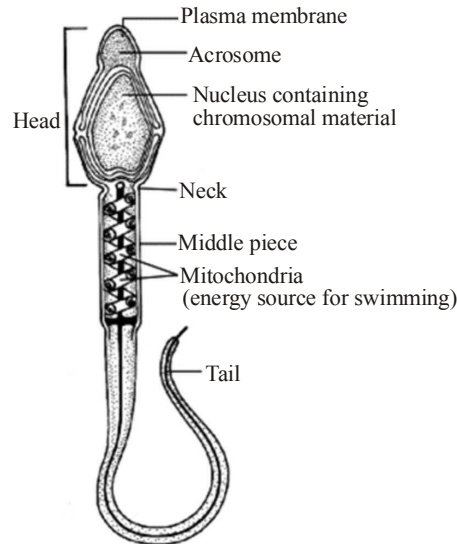


- (a) AA, Aa (b) Aa, aa (c) Aa, AA (d) Aa, Aa

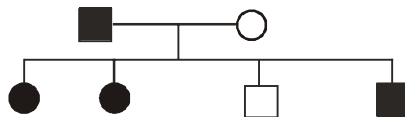
## SECTION-C

**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.

**Case :** Refer the diagram given below of human sperm and answer the questions that follows-



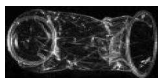
49. The body of sperm is covered by \_\_\_\_\_  
 (a) head (b) cell membrane (c) cell wall (d) cytoplasm
50. Egg is covered by a tough sheet of tissue that protects it from desiccation and infection by pathogens. But the same tissue also prevents sperm nuclei from encountering the egg nuclei. However, a part of sperm is known to release enzymes that digest this tough sheet. What part of sperm is it?  
 (a) Tail end (b) Mitochondria (c) Acrosome (d) Sperm nuclei
51. Rakesh and Reshma have difficulty conceiving a baby. They consulted a sex therapist. Sperm count of Rakesh was normal but the doctor observed that the motility of his sperm was less. What part of sperm do you think has the issue?  
 (a) Tail (b) Nucleus (c) Mitochondria (d) Acrosome
52. The major constituents of semen are \_\_\_\_\_ and \_\_\_\_\_  
 (a) Sperms and RBCs (b) Sperms and Blood plasma  
 (c) Sperms and seminal plasma (d) Sperms and WBCs
53. Which of the following is not an essential feature of sperms that determine the fertility of a male?  
 (a) Sperm count (b) Sperm motility (c) Sperm height (d) Sperm production rate
54. What part of sperm holds the haploid chromatin?  
 (a) Acrosome (b) Head (c) Tail (d) Neck
55. Study the pedigree chart of a certain family given below and select the correct conclusion which can be drawn for the character.



- (a) The female parent is heterozygous.  
 (b) The parents could not have had a normal daughter for this character.  
 (c) The trait under study could not be colourblindness.  
 (d) The male parent is homozygous dominant.
56. Which of the following figure of contraceptives contains progesterone alone or in combination with estrogen and used as injection or implants by females?



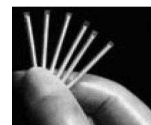
(b)



(c)

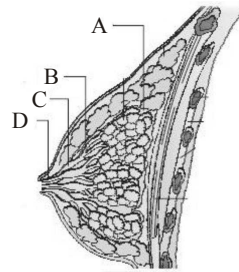


(d)

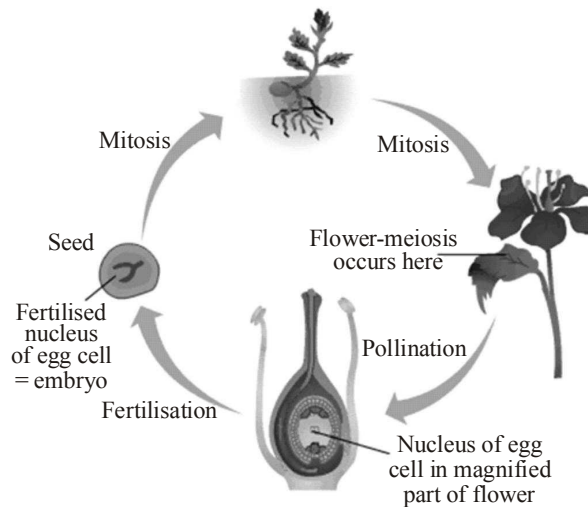




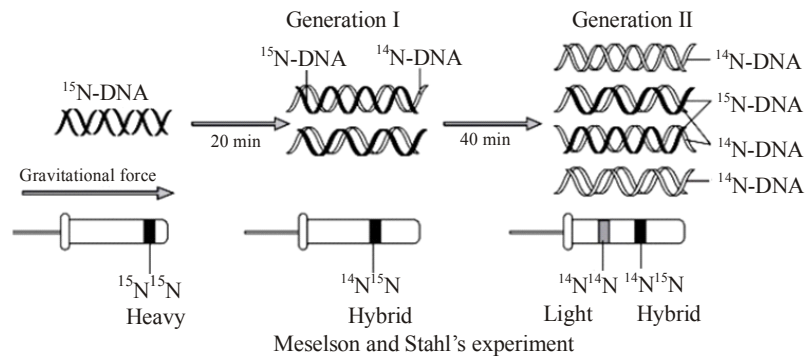
57. Refer the figure of mammary gland with few structure marked as A, B, C and D. Which structure contains clusters of milk secreting cells?



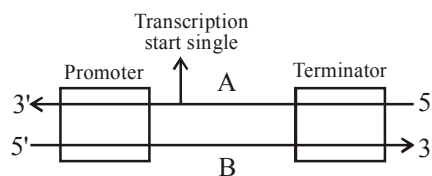
- (a) A                      (b) B                      (c) C                      (d) D
58. Female gametophyte of angiosperms is represented by



- (a) ovule                      (b) megaspore mother cell                      (c) embryo sac                      (d) nucellus
59. In Meselson and stahl's experiments, heavy DNA was distinguished from normal DNA by centrifugation in



- (a) CsOH gradient                      (b)  $^{14}\text{NH}_4\text{CL}$                       (c)  $^{15}\text{NH}_4\text{Cl}$                       (d) CsCl gradient
60. In the figure, strand A and B represent respectively



- (a) A-Coding strand, B-Template strand                      (b) A-Template strand, B-Coding strand
- (c) Both (a) & (b)                      (d) None of them



# OMR ANSWER SHEET

## Sample Paper No – 6

- ★ Use Blue / Black Ball pen only.
- ★ Please do not make any stray 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 darkened / half darkened circle might be rejected.

Start time : \_\_\_\_\_ End time \_\_\_\_\_ Time taken \_\_\_\_\_

1. Name (in Block Letters)

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2. Date of Exam

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3. Candidate's Signature

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### 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	
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