

Time allowed: 45 minutes

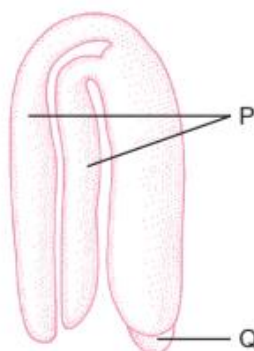
Maximum Marks: 200

*General Instructions: Same as Practice Paper-I.***Choose the correct option:**

1. The statements given below describe certain features that are observed in the pistil of flowers.
- | | |
|--------------------------------------|---|
| (i) Pistil may have many carpels | (ii) Each carpel may have more than one ovule |
| (iii) Each carpel has only one ovule | (iv) Pistil have only one carpel |

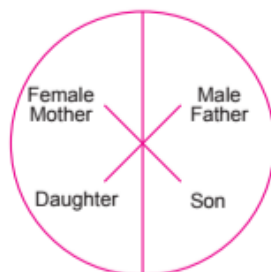
Choose the statements that are true from the options below.

- | | | | |
|------------------|-------------------|-------------------|--------------------|
| (a) (i) and (ii) | (b) (i) and (iii) | (c) (ii) and (iv) | (d) (iii) and (iv) |
|------------------|-------------------|-------------------|--------------------|
2. Identity (P) and (Q) in the following diagram of a typical dicot embryo.



- | | |
|--------------------------------|-------------------------------|
| (a) P—Cotyledons Q—Root cap | (b) P—Hypocotyl Q—Root cap |
| (c) P—Cotyledons Q—Plumule | (d) P—Plumule Q—Radicle |
3. Apple and strawberry are
- | | | | |
|------------------|-----------------|---------------------------|-------------------|
| (a) false fruits | (b) true fruits | (c) parthenocarpic fruits | (d) none of these |
|------------------|-----------------|---------------------------|-------------------|
4. Pollen grains are kept viable by preserving in
- | | | | |
|------------------|------------------|------------------|----------------|
| (a) liquid H_2 | (b) liquid O_2 | (c) liquid N_2 | (d) liquid air |
|------------------|------------------|------------------|----------------|
5. More than one and fused pistil is termed as
- | | |
|---------------------------------|--------------------------------|
| (a) multicarpellary, apocarpous | (b) megacarpellary, syncarpous |
| (c) multicarpellary, syncarpous | (d) megacarpellary, apocarpous |
6. Number of eggs released from both ovaries of a non-pregnant woman in a year is
- | | | | |
|--------|--------|-------|---------|
| (a) 24 | (b) 12 | (c) 6 | (d) 416 |
|--------|--------|-------|---------|
7. Which of the following functions as endocrine gland after ovulation?
- | | | | |
|---------------------|--------------------|-------------------------|-----------------------|
| (a) Stroma of ovary | (b) Zona pellucida | (c) Germinal epithelium | (d) Graafian follicle |
|---------------------|--------------------|-------------------------|-----------------------|

8. During spermiogenesis _____ is transformed to _____.
 (a) spermatogonium, primary spermatocyte (b) spermatid, sperm
 (c) secondary spermatocyte, spermatid (d) primary spermatocyte, secondary spermatocyte
9. Correct sequence of hormone secretion from beginning of menstruation is
 (a) FSH, progesterone, estrogen (b) FSH, estrogen, progesterone
 (c) estrogen, FSH, progesterone (d) estrogen, progesterone, FSH
10. Which of the following ARTs would you suggest to form an embryo in laboratory conditions without a donor for a couple in which the male partner can inseminate normally but mobility of sperms is very low?
 (a) IUD (b) ICSI (c) GIFT (d) None of these
11. Chromosome number of female with Turner's syndrome is
 (a) 47 (b) 46 (c) 23 (d) 45
12. Gene for colour blindness is
 (a) X-linked recessive (b) X-linked dominant (c) Y-linked (d) autosomal
13. Klinefelter's syndrome is represented by genotype
 (a) 44+XO (b) 44+XXY
 (c) 44+XXX (d) an extra chromosome in 21st pair
14. What is the probability of a child born to blood group AB mother and blood group O father to have blood group A?
 (a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{1}{8}$ (d) 0
15. Represented below is the inheritance pattern of a certain type of trait in humans. Which one of the following conditions could be an example of this pattern?



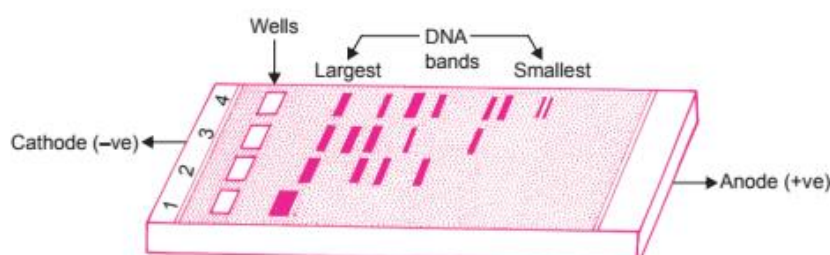
- (a) Phenylketonuria (b) Sickle cell anaemia
 (c) Haemophilia (d) Thalassemia
16. Site of *t*RNA that binds to *m*RNA molecules is
 (a) codon (b) 5' end
 (c) 3' end (d) anticodon
17. Consider the following:
 1. Codes for amino acid methionine 2. Initiation codon
 3. Stop codon 4. Sense codon
 Which of the above are true with respect to AUG?
 (a) 1, 2 and 3 are correct (b) 2, 3 and 4 are correct
 (c) 1, 2 and 4 are correct (d) Only 1 is correct
18. Which of the following is needed during DNA replication?
 (a) DNA polymerase and DNA ligase (b) RNA polymerase and translocase
 (c) DNA polymerase only (d) DNA ligase only

19. In *E. coli*, according to the operon theory, an operator gene combines with
 (a) inducer gene to "switch on" structural gene transcription.
 (b) regulator gene to "switch on" structural gene transcription.
 (c) regulator protein to "switch off" structural gene transcription.
 (d) regulator protein to "switch on" structural gene transcription.
20. Eukaryotes differ from prokaryotes in mechanism of DNA replication due to
 (a) different enzymes for opening of strands. (b) use of DNA primers instead of RNA primers.
 (c) being unidirectional rather than bidirectional. (d) being discontinuous rather than semi-discontinuous.
21. Industrial melanism is an example of
 (a) mutation (b) Neo-Lamarckism (c) Neo-Darwinism (d) natural selection
22. Which of the following amino acids was not found to be synthesised in Miller's experiment?
 (a) Alanine (b) Asparic acid (c) Glycine (d) Glutamic acid
23. Which one of the following statements is correct?
 (a) There is no evidence of the existence of gills during embryogenesis of mammal.
 (b) All plant and animals cells are totipotent.
 (c) Ontogeny repeats phylogeny.
 (d) Stem cells are specialized cells.
24. Receptors of cannabinoids are present mainly in the
 (a) liver (b) brain (c) heart (d) spleen
25. Morphine is extracted from
 (a) *Rauwolfia serpentina* (b) *Papaver somniferum* (c) *Aconitum napellus* (d) *Cinchona officinalis*
26. Which of the following organs of the body is storehouse of *Plasmodium*?
 (a) Liver (b) Spleen (c) RBC (d) Lungs
27. MALT are present within the lining of
 (a) respiratory tract (b) digestive tract (c) urogenital tract (d) all of the above
28. What are explants?
 (a) Small exploited parts of plant. (b) Small plant parts used for tissue culture.
 (c) Plant parts collected after harvest. (d) Plant parts used for experimentation.
29. Hybrid vigour can be induced by
 (a) self-pollination (b) clonal selection (c) crossing two plants (d) emasculation
30. Identify the correct set of biofertilisers.
 (a) *Nostoc*, *Anabaena*, *Phytophthora* (b) *Azolla*, *Azospirillum*, *Ulothrix*
 (c) *Azotobacter*, *Anabaena*, *Sorghum* (d) *Anabaena*, *Azotobacter*, *Azospirillum*
31. If someone wants to make curd from milk, a small amount of curd is added to fresh milk. The small amount of curd containing millions of LAB is known as
 (a) accelerator (b) promoter (c) inoculum (d) germ
32. Match the following :

Column I	Column II
1. <i>Aspergillus niger</i>	A. Butyric acid
2. <i>Clostridium butylicum</i>	B. Citric acid
3. <i>Acetobacter aceti</i>	C. Acetic acid

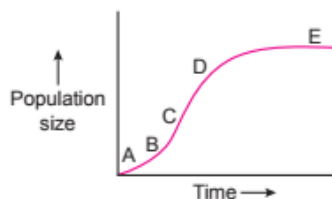
- (a) 1—A, 2—B, 3—C (b) 1—C, 2—B, 3—A
 (c) 1—B, 2—A, 3—C (d) 1—C, 2—A, 3—B

33. Which of the following statements is true of biocontrol agent?
- (1) It is used to control butterfly caterpillars.
 - (2) It is available in sachets as dried spores.
 - (3) It is sprayed on vulnerable plants such as *Brassicas*.
- (a) 1 and 2 (b) 1 and 3 (c) 1, 2 and 3 (d) Only 2
34. Which of the following is not a characteristic of the plasmids?
- (a) Extranuclear (b) Single-stranded
(c) Independent replication (d) Circular DNA
35. Which of the following is(are) used in recombinant DNA technology?
1. Agarose gel 2. Restriction endonuclease
 3. Plasmid vector 4. Ethidium bromide
- (a) 1 and 2 (b) 2 and 3
(c) 3 and 4 (d) All of these
36. Bioreactors are useful in
- (a) separation and purification of a product (b) processing of large volumes of culture
(c) micro-injection (d) isolation of genetic material
37. Study the diagram below and answer the following question.



- DNA samples are loaded in
- (a) opposite side of the wells (b) the wells
(c) between the wells (d) any place on the agarose gel
38. *CryIIAb* endotoxins obtained from *Bacillus thuringiensis* are effective against
- (a) flies (b) mosquitoes
(c) bollworms (d) nematodes
39. A and B chain of human insulin are joined by
- (a) disulphide bridge (b) glycosidic bond
(c) phosphodiester bond (d) hydrogen bond
40. Human insulin is being commercially produced from a transgenic species of
- (a) *Rhizobium* (b) *Saccharomyces*
(c) *Escherichia* (d) *Mycobacterium*
41. Which of the following has a negative effect on the population growth rate?
- (a) Immigration (b) Emigration
(c) Emigration and mortality (d) Immigration and natality
42. In a population, per capita birth rate is 0.17 and per capita death rate is 0.04 during a unit time period. The value of intrinsic rate of natural increase, i.e., r is
- (a) 0.13 (b) 0.17
(c) 0.04 (d) 0.15

43. In the logistic population growth curve shown below (A to E), the rate of growth is greatest at which point ?



- (a) A (b) B (c) C (d) D

44. Match the following and select the correct option.

- | | |
|-----------------------|---------------------|
| (A) Earthworm | (i) Pioneer species |
| (B) Succession | (ii) Detritivore |
| (C) Ecosystem service | (iii) Natality |
| (D) Population growth | (iv) Pollination |

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

45. If 20 J of energy is trapped at producer level, then how much energy will be available to peacock as food in the following chain?

plant → mice → snake → peacock

- (a) 0.02 J (b) 0.002 J
(c) 0.2 J (d) 0.0002 J

46. Secondary succession takes place on/in

- (a) newly created pond (b) newly cooled lava
(c) bare rock (d) degraded forest

47. Which of the following is a cause for loss of biodiversity ?

- (a) Destruction of habitat (b) Invasion by alien species
(c) Over-exploitation of natural resources (d) All of the above

48. _____ is not observed in biodiversity hot spots.

- (a) Species richness (b) Endemism
(c) Accelerated species loss (d) Lesser inter-specific competition

49. Which one of the following statements is incorrect in case of Bhopal tragedy?

- (a) Methyl isocyanate gas leakage took place. (b) Thousands of human beings died.
(c) Radioactive fall-out engulfed Bhopal. (d) It took place on the night of December 2/3, 1984.

50. "Good ozone" is found in the

- (a) mesosphere (b) troposphere
(c) stratosphere (d) ionosphere

Answers

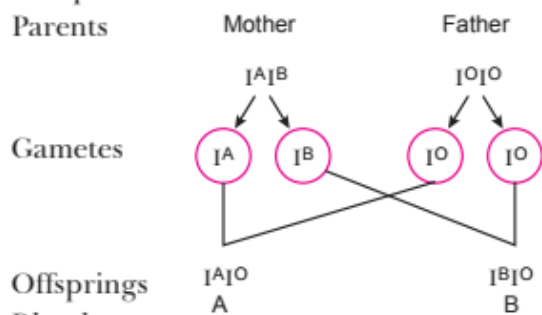
PRACTICE PAPER – 20

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|---------|---------|---------|---------|---------|---------|---------|
| 1. (a) | 2. (a) | 3. (a) | 4. (c) | 5. (c) | 6. (b) | 7. (d) |
| 8. (b) | 9. (b) | 10. (b) | 11. (d) | 12. (a) | 13. (b) | 14. (a) |
| 15. (c) | 16. (d) | 17. (c) | 18. (a) | 19. (c) | 20. (d) | 21. (d) |
| 22. (d) | 23. (c) | 24. (b) | 25. (b) | 26. (b) | 27. (d) | 28. (b) |
| 29. (c) | 30. (d) | 31. (c) | 32. (c) | 33. (c) | 34. (b) | 35. (d) |
| 36. (b) | 37. (b) | 38. (c) | 39. (a) | 40. (c) | 41. (c) | 42. (a) |
| 43. (c) | 44. (d) | 45. (a) | 46. (d) | 47. (d) | 48. (c) | 49. (c) |
| 50. (c) | | | | | | |

Explanations

PRACTICE PAPER – 20

3. (a) Fruits that develop from the thalamus or other parts of a flower, apart from ovary, are called false fruits. Apple and strawberry do not develop from ovary, therefore they are false fruits.
6. (b) In human females one egg is released every month from both the ovaries alternately. So, in a year 12 eggs are released, 6 from each ovary.
7. (d) After ovulation Graffian follicle transforms into corpus luteum and secretes the hormone progesterone.
10. (b) ICSI stands for Intra Cytoplasmic Sperm Injection. It is a procedure to form an embryo by directly injecting the sperm into an ovum.
14. (a) The possible cross is:



Blood groups
So, the probability of each blood group is $1/2$.

42. (a) Intrinsic rate of natural increase (r) =
Birth rate – Death rate
 $= 0.17 - 0.04 = 0.13$

43. (c) Rate of growth is measured by the steepness of the curve. The curve is steepest at the point C. Hence, the rate of growth is greatest at C.

