KCET Board Exam – 2021

Subject: Biology **CODE: _____**

1. How many microsporangia are located at the corners of a typical bilobed anther of angiosperm?

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

2. **Assertion**: In Bryophytes & Pteridophytes the number of male gametes produced is several thousand times the number of female gametes produced.

   Reason: Large number of male gametes fail to reach the female gametes during transport.

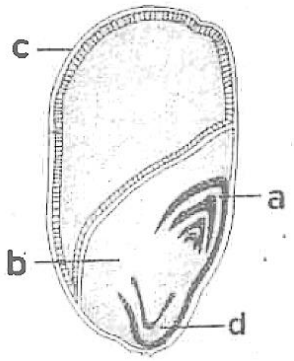
   (a) Assertion is correct but reason in incorrect

   (b) Both Assertion and reason are correct

   (c) Both Assertion and reason are incorrect

   (d) Assertion is incorrect but reason is correct

3. In the given diagram identify the parts labelled as a, b, c and d.



   (a) a → Coleoptile, b→ Scutellum, c→ Pericarp, d→ Coleorhiza

   (b) a→ Coleoptile, b→ Scutellum, c→ Coleorhiza, d→→ Pericarp

   (c) a → Pericarp, b→ Coleorhiza, c→ Scutellum, d→ Coleoptile

   (d) a→ Coleorhiza, b→ Coleoptile, c→ Scutellum, d→ Pericarp

4. Consider the following statements & choose the correct answer from the given options.

   Statement 1: Innermost layer of microsporangium is tapetum.

   Statement 2: Cells of tapetum possess dense cytoplasm more than one nucleus and nourishes developing pollen grains.

   (a) Both Statements 1 & 2 are incorrect

   (b) Both Statements 1 & 2 are correct

   (c) Statement 1 is correct & 2 is incorrect.

   (d) Statement 2 is correct & 1 is incorrect

5. Identify the correct statement.

   (a) Only one megaspore present towards chalazal end remains functional.

   (b) 3 megaspore present towards chalazal end degenerate gradually.

   (c) Each megaspore mother cell, directly develops into a megaspore.

   (d) Each female gametophyte is 7-celled & 7-nucleated structure.

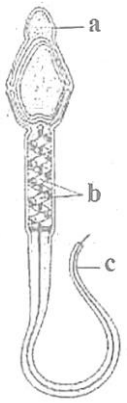
6. Which of the following aquatic plant does not show pollination by water?

   (a) *Vallisneria* (b) *Hydrilla* (c) Water hyacinth (d) *Zostera*

7. Which cell of the female gametophyte is involved in the formation of primary endosperm nucleus (PEN) after fertilization?

(a) Antipodals (b) Synergids (c) Egg cell (d) Central cell

8. In the given diagram of human sperm, identify the functions of the labelled parts. a, b and c.



(a) a→ Helps in penetration of sperm into ovum.
b→ Helps in movement of sperm.
c→ Provides energy for the movement of sperms into the female reproductive tract.

(b) a→ Helps in penetration of sperm into ovum
b→ Provides energy for the movement of sperm
c→ Helps in movement of sperm

(c) a→ Helps in movement of sperm
b→ Helps in penetration of sperm into ovum
c→ Provides energy for the movement of sperms

(d) a→ Provides energy for the movement of sperm
b→ Helps in movement of sperm
c→ Helps in penetration of sperm into ovum

9. Select the correct path of flow of milk during breast feeding.

(a) Mammary tubules → Mammary duct→ Mammary ampulla→ Lactiferous duct → Alveoli

(b) Mammary tubules → Mammary duct → Lactiferous duct→ Mammary ampulla → Alveoli

(c) Alveoli → Mammary tubules → Mammary ampulla → Mammary duct → Lactiferous duct

(d) Alveoli → Mammary tubules → Mammary duct → Mammary ampulla→ Lactiferous duct

10. Under the influence of oxytocin which layer of the uterus exhibits strong contractions during parturition?

(a) Endometrium (b) Myometrium (c) Perimetrium (d) Both (a) and (c)

11. Select the incorrect statement about contraceptives.

(a) They are regular requirements for the maintenance of reproductive health.

(b) They have a significant role in checking uncontrolled growth of population.

(c) They are practised against a natural reproductive events like conception or pregnancy.

(d) The possible ill-effects like nausea, abdominal pain, irregular menstrual bleeding or even breast cancer should not be totally ignored.

12. The method of directly injecting a sperm into ovum is called

(a) GIFT (b) ZIFT (c) ICSI (d) IVF-ET

13. Match Column I with Column II and find the correct answer:

Column I		**Column II**	
(1)	Aneuploidy	(p)	Increase in whole set of chromosomes
(2)	Monoploidy	(q)	Loss or gain of a chromosome
(3)	Polyploidy	(r)	Two sets of chromosomes
(4)	Diploidy	(s)	A single set of chromosomes

(a) 1-p, 2-q, 3-r, 4-s (b) 1-r, 2-p, 3-q, 4-s (c) 1-q, 2-s, 3-p, 4-r (d) 1-s, 2-r, 3-p, 4-q

14. The genotype of a husband and wife are I^AI^B & I^AI^o. Among the blood types of their children, how many different genotypes & phenotypes are possible?

(a) 3 genotypes; 3 phenotypes (b) 4 genotypes; 3 phenotypes

(c) 4 phenotypes; 3 genotypes (d) 4 phenotypes; 4 genotypes

15. What is the possible blood group of children whose parents are heterozygous for A & B blood groups?

(a) A, B only (b) A, B, AB & O (c) AB only (d) A, B & AB only

16. Match the Column I with Column II

Column I		**Column II**	
(i)	Autosomal trisomy	(p)	Turner's syndrome
(ii)	Allosomal trisomy	(q)	Mendelian disorder
(iii)	Allosomal Monosomy	(r)	Klinefelter's syndrome
(iv)	Cystic fibrosis	(s)	Down's syndrome

(a) (i)-(p), (ii)-(q), (iii)-(r), (iv)-(s) (b) (i)-(p), (ii)-(q), (iii)-(s), (iv)-(r)

(c) (i)-(s), (ii)-(r), (iii)-(q), (iv)-(p) (d) (i)-(s), (ii)-(r), (iii)-(p), (iv)-(q)

17. Which among the following characters selected by Mendel in a pea plant is a recessive character?

(a) Inflated (full) pod (b) Green pod colour (c) White flower (d) Axillary flower

18. Match the scientists of Column I with their contributions in Column II

Column I		**Column II**	
(i)	Griffith	(p)	Lac operon
(ii)	Jacob and Monad	(q)	DNA is the genetic material
(iii)	Meselson and Stahl	(r)	Transforming principle
(iv)	Hershey and Chase	(s)	DNA replicates semi-conservatively

(a) (i)-(p), (ii)-(q), (iii)-(r), (iv)-(s) (b) (i)-(p), (ii)-(s), (iii)-(q), (iv)-(r)

(c) (i)-(r), (ii)-(p), (iii)-(s), (iv)-(q) (d) (i)-(r), (ii)-(q), (iii)-(p), (iv)-(s)

19. In which region of the t-RNA molecule is the amino-acid binding site located?

(a) 5' end (b) anticodon loop (c) 3' end (d) None of the above

20. E. Coli fully labelled with ^{15}N is allowed to grow in ^{14}N medium. The two strands of DNA molecule of the first generation bacteria have

(a) Same density and resemble with their parent DNA

(b) Same density but do not resemble with their parent DNA

(c) Different density but do not resemble with their parent DNA

(d) Different density but resemble with their parent DNA

21. Experiments involving use of radioactive thymidine to detect distribution of newly synthesized DNA in the chromosome was performed on which plant?

(a) Vicia faba (b) Pisum Satirum (c) Cocus nucifera (d) Antirrhinum

22. If the sequence of nucleotides in a template stand of DNA is 3'-ATGCTTCCGAAT-5'. Write the sequence in the corresponding region of the transcribed m-RNA.

(a) 5′-TAC GAA GGC CTT-3′ (b) 5′- UAC GAA GGC UUA – 3′

(c) 3′ - UAC GAA GGC UUA – 5′ (d) 3′ - TAC GAA GGC CTT – 5′

23. Pneumonia is caused by

(a) *Streptococcus pneumonia* (b) *Haemophilus influenzae*

(c) Both (a) & (b) (d) None

24. The development of quick immune response in a person infected with deadly microbes by administering preformed antibodies is

(a) Active immunity (b) Cell-mediated immunity

(c) innate immunity (d) Passive immunisation

25. Which is the most feared property of malignant tumors?

(a) Neoplasty (b) Metastasis

(c) Rapid invasive growth (d) Loss of contact inhibition

26. Identify the techniques useful in detecting the cancers of internal organs.

(a) CT (b) MRI (c) Radiography (d) All of the above

27. Which among the following plants is a source of drug which is native to America?

(a) *Papaver Somniferum* (b) *Erythroxylum coca*

(c) *Cannabis sativa* (d) *Atropa belladona*

28. The technology of biogas production was developed in India due to the efforts of

(a) KVIC (b) IARI (c) CDRI (d) Both (a) and (b)

29. Which among the following products of microbes is not obtained from fungi?

(a) Penicillin (b) Statins (c) Swiss cheese (d) Cyclosporin-A

30. Match the following

Column I		**Column II**	
(i)	Cyclosporin-A	(a)	Clot busters
(ii)	Streptokinase	(b)	Antibiotic
(iii)	Statins	(c)	Immuno suppressive agent
(iv)	Penicillin	(d)	Blood cholesterol lowering agent
		(t)	

(a) (i)-(c), (ii)-(a), (iii)-(d), (iv)-(b) (b) (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b)

(c) (i)-(a), (ii)-(b), (iii)-(c), (iv)-(d) (d) (i)-(a), (ii)-(b), (iii)-(d), (iv)-(c)

31. Taq polymerase that finds its application in PCR is obtained from

(a) *Thermus aquaticus* (b) *Agrobacterium tumifaciens*

(c) *Bacillus thuringiensis* (d) *Salmonella typhimurium*

32. Rop-gene which codes for the proteins involved in the replication of the plasmid pBR322 in *E.coli* is located at restriction site of

(a) Hind III (b) EcoRI (c) Pvu II (d) BamHI

33. Rapid antigen test and RT-PCR are the two diagnosis test for Covid-19 virus. PCR, a molecular diagnostic tool, stands for

(a) Polymerase chain reaction (b) Polymerase chain reagent

(c) Physiological chain reaction (d) Physiological chain reagent

34. Which of the following diagnostic tools allows the detection of very low concentration of bacterium or viruses by amplifying their nucleic acid?

(a) ELISA (b) PCR (c) Autoradiography (d) r-DNA technology

35. Silencing of a gene could be achieved through the use of

(a) Short interfering RNA (RNAi) (b) Antisense RNA

(c) By both (a) & (b) (d) None of the above

36. $\alpha-1$ antitrypsin is

(a) an antacid (b) an enzyme

(c) used to treat emphysema (d) used to treat arthritis

37. Identify the correct statement/s from the following:

1. Cuscuta is a chlorophyllous endoparasite.

2. The human liverfluke needs only one host to complete its life cycle.

3. The life cycle of endoparasite is more complex due to their extreme specialisation.

4. During the course of evolution the host bird's eggs have evolved to resemble the eggs of the parasitic bird.

(a) 1, 2, 3 (b) 2, 4 (c) Only 3 (d) 1, 3 and 4

38. Relate Column I with Column II with regard to predatory behaviour

Column I		**Column II**	
(1)	Calotropis	(p)	Invertebrates
(2)	*Pisaster*	(q)	Distasteful
(3)	Monarch butterfly	(r)	Cryptically coloured
(4)	Frogs	(s)	Cardioglycoside

(a) (1)-(s), (2)-(p), (3)-(r), (4)-(q) (b) (1)-(s), (2)-(p), (3)-(q), (4)-(r)

(c) (1)-(q), (2)-(s), (3)-(p), (4)-(r) (d) (1)-(r), (2)-(p), (3)-(q), (4)-(s)

39. Small mammals and birds are rarely found in polar regions. The reason is that

(a) They have a larger surface area relative to their volume

(b) They tend to gain heat very fast

(c) They expend less energy to generate body heat

(d) None of the above

40. Identify the incorrect statement.

(a) CAM plants close their stomata during daytime

(b) Seals have a thick layer of fat to reduce body heat

(c) Lizards bask in the sun during winter

(d) Tribes living in high altitude have the same RBC count as people living in the plains.

41. Population size keeps changing depending on different factor/s such as

(a) Food availability (b) Predation pressure (c) Adverse weather (d) All of the above

42. Identify the incorrect statement.

1. Speciation is generally a function of time.
2. Tropical environment is less seasonal, relatively more constant and predictable.
3. Solar energy contributes to high productivity
4. Temperate regions have remained relatively undisturbed for millions of years.

(a) 1, 2, 3, 4 (b) 2, 3 (c) Only 4 (d) 3, 4

43. The correct equation depicting species-area relationship is

(a) log S = log C + Z log A (b) log C= log S + Z log A

(c) log A = log C + Z log S (d) log Z= log C + S log A

44. Match Column I and Column II

Column I		**Column II**	
(1)	Narrowly utilitarian argument	(p)	Conserving biodiversity for major ecosystem services
(2)	Broadly utilitarian argument	(q)	Every species has an intrinsic value and moral duty to pass our biological legacy in good order to future generation
(3)	Ethical argument	(r)	Receiving benefits like food, medicine and industrial products

(a) (1)-(p), (2)-(q), (3)-(r) (b) (1)-(q), (2)-(r), (3)-(p)

(c) (1)-(r), (2)-(p), (3)-(q) (d) (1)-(r), (2)-(q), (3)-(p)

45. Identify the correct statement/s about ex situ conservation.

Advanced ex situ conservation includes

(i) Cryopreservation of gametes.ya

(ii) Plant tissue culture method.

(iii) Seed bank.

(iv) In vitro fertilisation.

(a) Only ii (b) i & ii (c) i, ii, iii, iv (d) None of the above

46. The concept of "Contagium vivum fluidum" was given by

(a) D. J. Ivanowsky (b) W. M. Stanley (c) M.W. Beijerinek (d) R. H. Whittaker

47. Identify the odd one out.

(a) Ustilago (b) Alternaria (c) Colletotrichum (d) Trichoderma

48. The plant body having holdfast, stipe and frond is a characteristic of

(a) Laminaria (b) Volvox (c) Gelidium (d) Porphyra

49. Identify the correct statement/s regarding class aves.

(1) Forelimbs are modified into wings and hindlimbs are modified for walking and swimming.

(2) Heart is completely four-chambered.

(3) They are homeotherms.

(4) They are oviparous and development is direct.

(a) Both 1 and 3 (b) Both 1 and 4 (c) 1, 2 and 3 (d) All are correct

50. Epigynous flower is one in which

(a) Ovary is superior and other floral parts are inferior

(b) Ovary is inferior and other floral parts are superior

(c) All the floral parts are at the same level

(d) None of the above

51. The following type of cell junction is not found in animal tissues

(a) Adhering junction (b) Tight junction (c) Gap junction (d) Loose junction

52. A bacterial flagellum is composed of

(a) Filament, hook and basal body (b) Vesicles, tubules and lamellae

(c) Pili, Fimbriae and filament (d) Hook, tubules and Fimbriae

53. Match the compounds of Column I with their functions in Column II

Column I		**Column II**	
(1)	Trypsin	(p)	Fights infectious agents
(2)	GLUT-4	(q)	Is an intercellular ground substance
(3)	Collagen	(r)	Works as an enzyme
(4)	Antibody	(s)	Enables glucose transport into cells

(a) (1)-(s), (2)-(r), (3)-(q), (4)-(p) (b) (1)-(r), (2)-(s), (3)-(p), (4)-(q)

(c) (1)-(s), (2)-(r), (3)-(p), (4)-(q) (d) (1)-(r), (2)-(s), (3)-(q), (4)-(p)

54. The correct sequence of events in prophase I is

(a) Synapsis → Crossing over → Chiasmata → Terminalisation.

(b) Crossing over → Synapsis → Chiasmata → Terminalisation.

(c) Chiasmata → Synapsis → Crossing over → Terminalisation.

(d) Chiasmata→ Crossing over → Synapsis → Terminalisation.

55. The enzyme that is not found is C_3 plants is

(a) ATP synthase (b) RUBP carboxylase (c) NADP reductase (d) PEP carboxylase

56. Match the location of the cell given in Column I with its function in Column II

Column I		**Column II**	
(1)	Mitochondrial matrix	(p)	Kreb's cycle
(2)	Cytoplasm	(q)	ETC
(3)	F_0 and F_1	(r)	Glycolysis
(4)	Inner mitochondrial membrane	(s)	ATP synthesis

(a) (1)-(p), (2)-(r), (3)-(s), (4)-(q) (b) (1)-(q), (2)-(s), (3)-(q), (4)-(r)

(c) (1)-(r), (2)-(q), (3)-(p), (4)-(s) (d) (1)-(s), (2)-(p), (3)-(r), (4)-(q)

57. Identify the incorrect statement/s.

(1) Kinetin is a derivative of Adenine which is a pyrimidine.

(2) The technique of decapitation is widely used in tea plantations.

(3) Ethylene is a gaseous plant hormone.

(4) Use of GA_3, hastens the malting process in brewing industry.

(5) ABA is a growth promoter.

(a) 1, 2, 3, 4 (b) Only 3 (c) 2, 3, 4 (d) 1 and 5

58. Calculate the cardiac output of an individual having 70 heart beats/min with a stroke volume of 55 ml.

(a) 3750 ml (b) 125 ml (c) 3850 ml (d) None of the above

59. In a standard ECG, one of the following functions of its components is not correctly interpreted.

(a) P is the contraction of only left atria.

(b) QRS complex represents ventricular contraction.

(c) T is the end of systole.

(d) P is the contraction of both atria.

60. Match the hormones of Column I with its functions in Column II

Column I		**Column II**	
(1)	Catecholamines	(p)	Diurnal rhythm
(2)	MSH	(q)	Immune response
(3)	Thymosins	(r)	Pigmentation
(4)	Melatonin	(s)	Stress hormone

(a) (1)-(s), (2)-(r), (3)-(q), (4)-(p) (b) (1)-(r), (2)-(q), (3)-(s), (4)-(p)

(c) (1)-(q), (2)-(s), (3)-(r), (4)-(p) (d) (1)-(p), (2)-(q), (3)-(r), (4)-(s)