

TEST SERIES CSIR-NET/JRF JUNE 2018

BOOKLET SERIES **C**

Paper Code **03**

Test Type: **TEST SERIES**

LIFE SCIENCES

Duration: 2:00 Hours

Date: 31-05-2018

Maximum Marks: 150

Read the following instructions carefully:

* Single Paper Test is divided into **THREE** Parts.

Part - A: This part shall carry **10** questions. Each question shall be of **2** marks.

Part - B: This part shall carry **35** questions. Each question shall be of **2** marks.

Part - C: This part shall contain **15** questions. Each question shall be of **4** marks.

* Darken the appropriate bubbles with HB pencil/Ball Pen to write your answer.

* There will be negative marking @25% for each wrong answer.

* The candidates shall be allowed to carry the Question Paper Booklet after completion of the exam.

* For rough work, blank sheet is attached at the end of test booklet.



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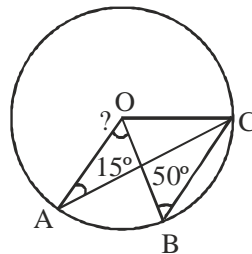


DOWNLOAD CAREER ENDEAVOUR APP:



PART-A

- Find the odd one in the given set of numbers
8, 27, 64, 100, 125, 216, 343
(a) 27 (b) 100 (c) 125 (d) 343
- A number consists of 3 digits whose sum is 10. The middle digit is equal to the sum of the other two and the number will be increased by 99 if its digits are reversed. The number is
(a) 145 (b) 253 (c) 370 (d) 352
- Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?
(a) 9 (b) 10 (c) 12 (d) 20
- The percentage profit earned by selling an article for Rs. 1920 is equal to the percentage loss incurred by selling the same article for Rs. 1280. At what price should the article be sold to make 25 percent profit?
(a) Rs 2000 (b) Rs. 2200 (c) Rs. 2400 (d) none
- The hardest substance available on earth is
(a) Gold (b) Iron (c) Diamond (d) Platinum
- It is more difficult to walk on a sandy road than on a concrete road because
(a) Sand is soft and concrete is hard
(b) The friction between sand and feet is less than that between concrete and feet
(c) The friction between sand and feet is more than that between concrete and feet
(d) The sand is grainy but concrete is smooth
- An application was received by class teacher in the afternoon of a weekday. Next day, she forwarded it to the student coordinator, who was on leave that day. The student coordinator put up the application to the principal next day in the evening. The principal studied the application and disposed off the matter on the same day, i.e. Saturday, which day was the application received by the class teacher?
(a) Monday (b) Wednesday (c) Tuesday (d) Thursday
- A cylindrical rod of iron whose height is 8 times its radius is melted and cast into spherical balls each of half the radius of the cylinder. The number of spherical balls is
(a) 12 (b) 16 (c) 24 (d) 48
- In the given figure O is the centre $\angle OBC = 50^\circ$ and $\angle OAC = 15^\circ$. Then the value of the $\angle AOB$ is



- (a) 30 (b) 40 (c) 20 (d) 70

10. In a certain code, SIKKIM is written as THLJLL. How is TRAINING written in that code?
(a) SQBHOHOF (b) UQBHOIOF
(c) UQBHOHOI (d) UQBHOHOF

PART-B

11. _____ is the process that induces the selection of activation of some genes by a cell, which are not activated by other cells of an embryo.
(a) Cell division (b) Cell differentiation
(c) Cell transformation (d) Cellular activation
12. Which among the following would lead to a dorsalized embryo ?
(a) Dorsal mutant (b) Ventral mutant
(c) Kruppel mutant (d) Biocide mutant
13. The “mid-blastula transition” is the point in development when
(a) translation of maternal mRNA is initiated. (b) cell determination becomes fixed.
(c) cell division in the embryo starts. (d) transcription of zygotic genes begins.
14. The concept of epigenesis described that
(a) embryos were differentiated cells.
(b) embryos were pre-formed in certain gender gametes.
(c) embryos were born from eggs.
(d) embryos were formed from new materials.
15. With respect to development of any organism, “autonomous specification” would result in which type of development ?
(a) Regulative (b) Mosaic
(c) Syncytial (d) Definitive
16. After a zygote formation, the series of mitotic division that occurs directly is known as
(a) gastrulation (b) cleavage
(c) meiosis (d) blastulation
17. _____ is the solid ball of undifferentiated cells that enters the uterus.
(a) Gastrula (b) Morula
(c) Blastocyst (d) Blastocyte
18. Blastocyst implantation occurs on
(a) 5th day (b) 3th day
(c) 7th day (d) 9th day
19. The vagus nerve is the cranial nerve numbering.
(a) 8 (b) 9
(c) 7 (d) 10
20. In homeotherms, _____ brain center regulate body temperature.
(a) cerebellum (b) tectum
(c) thalamus (d) hypothalamus



21. Sympathetic nervous system induce
 (a) digestive juice secretion (b) saliva secretion
 (c) heart beat (d) Both a and b
22. Choose the structure that is involved in aggression, defense and reproduction.
 (a) Hypothalamus (b) Massa Intermedia
 (c) Amygdala (d) Thalamus
23. Select the correct combination of genetic components that are essential for the transfer of T-DNA segment from *Agrobacterium tumefaciens* to plant cells.
 (a) Border repeat sequences and oncogenes (b) Border repeat sequences and *vir* genes
 (c) Opine biosynthetic genes and *vir* genes (d) Opine biosynthetic genes and oncogenes
24. Which one of the following cannot be a recognition sequence for a Type II restriction enzyme?
 (a) GAATTC (b) AGCT
 (c) GCGGCCGC (d) ATGCCT
25. Human genome sequencing project involved the construction of genomic library in
 (a) bacterial artificial chromosome (b) pBR322
 (c) bacteriophage (d) pcDNA 3.1
26. In nature, *Agrobacterium tumefaciens* mediated infection of plant cells leads to
 P. crown gall disease in plants
 Q. hairy root disease in plants
 R. transfer of T-DNA into the plant chromosome
 S. transfer of Ri-plasmid into the plant cell
 (a) S only (b) P and R only (c) Q and S only (d) Q only
27. Select the wrong statements
 1) The first restriction endonuclease discovered is Hind I.
 2) Type II RE is ATP dependent
 3) W. Arber discovered restriction endonuclease enzymes
 4) Citric acid is produced by *Acetobacter*.
 (a) 4 (b) 1, 3 (c) 2, 4 (d) 1, 2
28. Isoschizomers recognize
 (a) Same recognition sequence but different recognition site
 (b) Same recognition site and recognition sequence
 (c) Same recognition site and different recognition sequence
 (d) Different recognition site and different recognition sequence
29. What is the correct time for carrying out the alkaline phosphatase treatment?
 (a) After the cutting of vector has been done
 (b) Before the insert DNA and the vector are mixed
 (c) After the cutting of vector has been done but before the insert DNA and vector are mixed
 (d) After the mixing of insert DNA and vector
30. The original specimen submitted by author himself is termed as _____
 (a) Holotype (b) Paratype (c) Lectotype (d) Isotype
31. A biologist discovers an alga that is marine, multicellular, lacks flagella and centrioles and contains phycobilisomes. It probably belongs to which group?
 (a) Rhodophyta (b) Brown algae (c) Chlorophyta (d) Foraminifera



32. Which is only colourless animal parasite among dinoflagellates?
 (a) Noctiluca (b) Ceranium (c) Slime moulds (d) Protozoans
33. Which is known as 'fire algae' due to the phosphorescence activity?
 (a) Noctiluca (b) Gonyaulax (c) Plasmodium (d) Blastodinium
34. One life history trait that is not characteristic of very large size organism
 (a) Delayed age at first reproduction (b) Low population growth rate
 (c) Long life span (d) Many small offspring
35. Any of two or more related species that are morphologically nearly identical but are incapable of producing fertile hybrids?
 (a) Ecospecies (b) Coenospecies
 (c) Sibling species (d) Ecophenes
36. '*n*-dimensional hyper volume' where dimensions and hyper volume are alternating mode of space and resources available to organisms. This criteria is related with.
 (a) Grinnellian niche (b) Eltonian niche
 (c) Hutchinsonian niche (d) None of the above
37. The treatment which removes remaining inorganic compound and substances, such as nitrogen and phosphorus from drinking water.
 (a) Primary treatment (b) Secondary treatment
 (c) Tertiary treatment (d) None of the above
38. Which one of the following characteristics makes a species more prone to extinction?
 (a) Wide range of geographical habitat (b) Large population size
 (c) High genetic variability (d) Low reproductive potential
39. Match the List-I (National Parks) with List-II (The important animals)
- | List-I | List-II |
|---------------------------|-----------------|
| A) Kanha National Park | 1) Tiger |
| B) Gir National Park | 2) Asiatic lion |
| C) Bandipur National Park | 3) Elephant |
| | 4) Rhinoceros |
- Codes**
- | | A | B | C |
|-----|---|---|---|
| (a) | 2 | 3 | 4 |
| (b) | 3 | 4 | 1 |
| (c) | 2 | 1 | 3 |
| (d) | 1 | 2 | 3 |
40. Most biodiversity hot spot are in
 (a) Tropical rain forest (b) Mountainous regions
 (c) Dry shrublands (d) Wetlands
41. An island that is small and far from the main land as compared to a large island close to the main land.
 (a) would be expected to have low species diversity
 (b) would be expected to be in early successional stage
 (c) would have a small species diversity but a large abundance of organisms
 (d) what have a high rate of colonization but a high rate of extinction



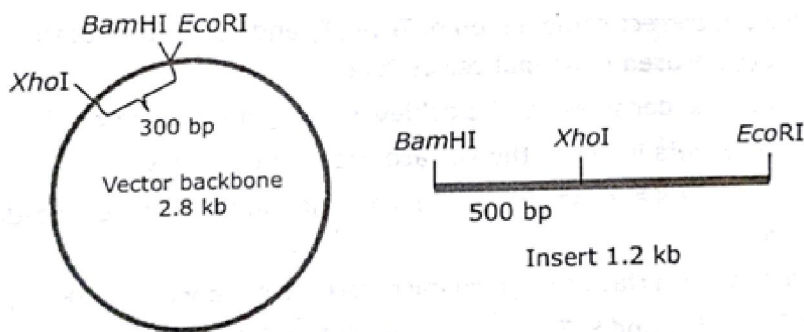
42. A conservation group is trying to save Puerto Rico's endemic species "Endemic" means
 (a) They live nowhere else (b) Predatory
 (c) They are endangered (d) They migrate from place to place
43. Evolutionarily, with which of the following could parental care in animals be associated?
 (a) Smaller clutch size (b) Polygamy
 (c) Greater longevity (d) Semel parity
44. In a population growing logistically and approaching carrying capacity (K), the change in density (N) per unit time (dN/dt) is maximum when, N equals to
 (a) K^2 (b) $K/2$ (c) K (d) $2K$
45. The animals of cold countries have relatively shorter and poorly developed ears, eyes, hairs and other phenotypic characters. This is known by which law?
 (a) Cope's Law (b) Dollo's Law
 (c) Allen's Law (d) Bergmann's Law.

PART-C

46. The difference between "fate" and "specification" is that
 (a) the alteration in the fate, but not their specification, occurs when the cells are transplanted from their normal region in an embryo to a different region in a recipient embryo.
 (b) the cell fate describes the allocation of cells to the germ layers, ectoderm, mesoderm or endoderm, whereas specification describes the exact tissues that each cell will ultimately become.
 (c) the fate map of an embryo does not change during development whereas the specification map of an embryo changes continually as the embryo's development proceeds.
 (d) the fate of a cell is determined by labelling that cell and followed it during normal development, whereas the specification state of a cell is determined by culturing a cell in an artificial medium and observing what tissues form from it.
47. A two-celled embryo is made of blastomeres A and B. if the two blastomeres are experimentally separated, the 'A' blastomere generates all the cells it would normally make. However, the 'B' blastomere in isolation make. Based on the above observations only, which one of the following conclusions is correct ?
 (a) 'A' blastomere is autonomously specified while 'B' blastomere is conditionally specified.
 (b) 'A' blastomere is conditionally specified, while 'B' blastomere is autonomously specified.
 (c) Descendants of 'A' blastomere are autonomously specified.
 (d) Descendants of 'B' blastomere can either be autonomously specified conditionally specified.
48. The cells adjacent to the progenitor vulva cells in *C. elegans* can be prevented from differentiating into vulva cells. This can be done because
 (a) these cells are too distant from the anchor cell to receive the LIN-3 signal.
 (b) these cells lack the ability to bind and respond to the LIN-3 signal.
 (c) these cells receive a signalling compound from a hypodermal cell that deactivates the LIN-3 signal.
 (d) these cells have condensed their chromatin in the regions responsive to the LIN-3 signal.



49. Choose the statement about the parasympathetic division of the autonomic nervous system.
- Parasympathetic postganglionic neurons are found in spinal ganglia.
 - Parasympathetic postganglionic fibres secrete acetylcholine onto their target organs.
 - Parasympathetic vasodilator fibres are absent in the salivary glands.
 - Parasympathetic preganglionic fibres are found in some cranial nerves.
50. A toxin that binds specifically to voltage-gated sodium channels in axons would be expected to
- decrease the hyperpolarization phase of the action potential.
 - prevent the depolarization phase of the action potential.
 - prevent the repolarization phase of the action potential.
 - decrease the release of neurotransmitter molecules.
51. A 1.2 kb DNA fragment was cloned into *Bam*HI and *Eco*RI sites located on a 2.8 kb cloning vector. The *Bam*HI and *Eco*RI sites are adjacent to each other on the vector backbone. The vector contains an *Xho*I site located 300 bp upstream of the *Bam*HI site. An internal *Xho*I site is present in the gene sequence as shown in the figure. The resultant recombinant plasmid is digested with *Eco*RI and *Xho*I and analyzed through 1% agarose gel electrophoresis. Assuming complete digestion with *Eco*RI and *Xho*I, the DNA fragments (in base pairs) visible on the agarose gel will correspond to



- 2800, 700 and 500
 - 2800, 700 and 800
 - 2500, 700 and 800
 - 2500, 1200 and 300
52. Match the items in Group I with Group II
- | Group-I | Group-II |
|---|------------------------|
| P. λ -phage | 1. 35–45 kb |
| Q. Bacterial Artificial Chromosomes (BACs) | 2. 100–300 kb |
| R. P1 derived Artificial Chromosomes (PACs) | 3. ≤ 300 kb |
| S. λ -cosmid | 4. 5–25 kb |
| (a) P-3, Q-4, R-1, S-2 | (b) P-1, Q-3, R-2, S-4 |
| (c) P-4, Q-3, R-2, S-1 | (d) P-1, Q-2, R-3, S-4 |

53. **Group-I**
- P. $\begin{matrix} \downarrow \\ \text{AG} \cdot \text{CT} \\ \uparrow \\ \text{TC} \cdot \text{GA} \end{matrix}$
- Q. $\begin{matrix} \downarrow \\ \text{GTPy} \cdot \text{PuAC} \\ \uparrow \\ \text{CAPu} \cdot \text{PyTG} \end{matrix}$
- R. $\begin{matrix} \downarrow \\ \text{C} \cdot \text{C} \cdot \text{GG} \\ \uparrow \\ \text{GG} \cdot \text{C} \cdot \text{C} \end{matrix}$
- S. $\begin{matrix} \downarrow \\ \text{A} \cdot \text{AG} \cdot \text{CTT} \\ \uparrow \\ \text{TTC} \cdot \text{GA} \cdot \text{A} \end{matrix}$
- Group-II**
1. EcoRI
 2. AluI
 3. HpaII
 4. HindIII
 5. PstI
 6. HincII
- (a) P-1, Q-5, R-6, S-3
(b) P-2, Q-6, R-3, S-4
(c) P-1, Q-6, R-4, S-2
(d) P-1, Q-2, R-6, S-4
54. In which one of the following the genus name, its two characters and its class/phylum are correctly matched?
- | Genus | Two character | Class/Phylum |
|----------------------|---------------------------------|---------------------|
| 1. <i>Aurelia</i> | (a) Cnidoblasts | Coelenterata |
| 2. <i>Ascaris</i> | (b) Organ level of organization | Annelida |
| | (a) Body segmented | Amphibia |
| 3. <i>Salamandra</i> | (b) Males and females distinct | Mammalia |
| | (a) A tympanum represents ear | |
| | (b) Fertilization is external | |
| 4. <i>Pteropus</i> | (a) Skin possesses hair | |
| | (b) Oviparous | |
- (a) 1
(b) 2
(c) 3
(d) 4
55. A wildlife pathologist is examining some skin tissue from a dead frog. She notes the presence of a fungus. She cultures some of the fungal cells and notices that some of the cells are flagellated. She concludes that the frog has a fungal disease caused by
- (a) an ascomycete (b) a zygomycete (c) a basidiomycete (d) a chytrid
56. Match List-I (animals) with List-II (the group to which they belong) and select the correct answer using the codes given below the lists.
- | List-I | List-II |
|-----------------------|--------------------------|
| A) Hammerheaded shark | 1) Marsupial |
| B) Pangolin | 2) <i>Condriichthyes</i> |
| C) Emu | 3) <i>Neornithes</i> |
| D) Mud puppy | 4) Eutheria |
| | 5) Urodela |
- Codes**
- | A | B | C | D |
|-------|---|---|---|
| (a) 2 | 4 | 3 | 5 |
| (b) 4 | 3 | 5 | 1 |
| (c) 2 | 4 | 5 | 1 |
| (d) 4 | 2 | 3 | 5 |



57. Desert populations of spiny cacti experience predation by peccaries, which consume fleshy part of cactus. This can be prevented by increasing the number of spine on the cactus. But there is also an insect that will lay its eggs in spines if the are densely populated latterly larva of these egg eat this plant too. So, what will be the evolutionary strategy of this plant in aspect of spine number?

- (a) Stabilizing selection (b) Directional selection
(c) Disruptive selection (d) Natural selection

58. Match List-I (plants) with List-II (typical) habitat and select the correct answer using the codes given below:

List-I

- A) Utricularia
B) Anagallis
C) Loranthus
D) Rhizophora

List-II

- 1) Desert
2) On tree branches
3) Water
4) Wheat fields
5) Mangroves

Codes

	A	B	C	D
(a)	3	4	5	2
(b)	4	1	2	5
(c)	5	1	2	3
(d)	3	4	2	5

59. A few members of a population have reached a favourable habitat with few predators and unlimited resources, but the population growth rate is slower than that of the parent population. What is the possible explanation for this situation?

- (a) Genetic makeup of these founders may be more favourable than that of the parent population
(b) The parent population may still be in an exponential part of its growth curve and not yet limited by density dependent factors
(c) The allee effect may be operating there are not enough population members present for successful reproduction.
(d) Option (b) and (c)

60. Match the following List-I and List-II and select the correct answer using the codes given below the lists.

List-I

- A) Moderate to heavy rainfall through out the year
B) Moderate to heavy rainfall occurring in 7 to 8 months in a year
C) Little summer precipitation but sufficient rainfall in the winter
D) Sufficient rainfall in summer and little in winter

List-II

- 1) Scrub forests
2) Grass land
3) Evergreen rain forests
4) Deciduous forests

Codes

	A	B	C	D
(a)	2	4	3	1
(b)	3	1	4	2
(c)	2	3	1	4
(d)	3	4	1	2



Space for Rough Work





**CSIR-UGC-NET/JRF LIFE SCIENCES
TEST SERIES-3**

(Part-A + Developmental Biology + Human Physiology + Recombinant DNA Technology
+ Diversity + Ecology + Relevant Technique)

Date : 31-05-2018

[ANSWER KEY]

PART-A

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (b) | 2. (b) | 3. (b) | 4. (a) | 5. (c) |
| 6. (b) | 7. (d) | 8. (d) | 9. (d) | 10. (d) |

PART-B

- | | | | | |
|---------|---------|---------|---------|---------|
| 11. (b) | 12. (a) | 13. (d) | 14. (d) | 15. (b) |
| 16. (b) | 17. (b) | 18. (c) | 19. (d) | 20. (d) |
| 21. (c) | 22. (c) | 23. (b) | 24. (d) | 25. (a) |
| 26. (b) | 27. (d) | 28. (b) | 29. (c) | 30. (a) |
| 31. (a) | 32. (d) | 33. (a) | 34. (d) | 35. (c) |
| 36. (c) | 37. (c) | 38. (d) | 39. (d) | 40. (a) |
| 41. (a) | 42. (a) | 43. (a) | 44. (b) | 45. (c) |

PART-C

- | | | | | |
|---------|---------|---------|---------|---------|
| 46. (d) | 47. (a) | 48. (a) | 49. (b) | 50. (b) |
| 51. (c) | 52. (c) | 53. (b) | 54. (c) | 55. (d) |
| 56. (a) | 57. (a) | 58. (d) | 59. (d) | 60. (b) |

