Resonance®
Educating for better tomorrow

INDIAN ASSOCIATION OF PHYSICS TEACHERS

NATIONAL STANDARD EXAMINATION IN BIOLOGY (NSEB) 2016-17

Examination Date : 27-11-2016 **Time: 2 Hrs.** **Max. Marks : 240**

PAPER CODE : B223 HBCSE Olympiad (STAGE - 1)

Write the question paper code mentioned above on YOUR answer sheet (in the space provided), otherwise your answer sheet will NOT be assessed. Note that the same Q. P. Code appears on each page of the question paper.

INSTRUCTION TO CANDIDATES

1. Use of mobile phones, smart phones, ipads during examination is STRICTLY PROHIBITED.
2. In addition to this question paper, you are given answer sheet along with Candidate's copy.
3. On the answer sheet, fill up all the entries carefully in the space provided, **ONLY In BLOCK CAPITALS**. Use only **BLUE or BACK BALL PEN** for making entries and marking answer.

   Incomplete / incorrect / carelessly filled information may disqualify your candidature.
4. On the answer sheet, use only BLUE or BLACK BALL POINT PEN for making entries and filling the bubbles.
5. The email ID and date of birth entered in the answer sheet will be your login credentials for accessing performance report. Please take care while entering.
6. Question paper has 80 multiple choice questions. Each question has four alternatives, out of which only one is correct. Choose the correct alternative and fill the appropriate bubble, as shown.

7. A correct answer carries 3 marks and 1 mark will be deducted for each wrong answer.
8. Any rough work should be done only in the space provided.
9. Use of a nonprogrammable calculator is allowed.
10. No candidate should leave the examination hall before the completion of the examination.
11. After submitting your answer paper, take away the Candidate's copy for your reference.

    Please DO NOT make any mar other than filling the appropriate bubbles properly in the space provided on the answer sheet. Answer sheet are evaluated using machine, hence CHANGE OF ENTRY IS NOT ALLOWED.

    Scratching or overwriting may result in wrong score.

    DO NOT WRITE ANYTHING ON THE BACK OF ANSWER SHEET.

Read the following instructions after submitting the answer sheet.

12. Comment regarding this question paper, if any, may be sent by email only to iapt.nse@gmail.com till **29th November 2016.**
13. The answers/solutions to this question paper will be available on our website www.iapt.org.in by **2nd December, 2016.**
14. **Certificates & Awards**

    Following certificates are awarded by the IAPT to students successful in NSEs

    (i) Certificates to "Centre Top" 10% students

    (ii) Merit certificates to "State wise Top" 1% students.

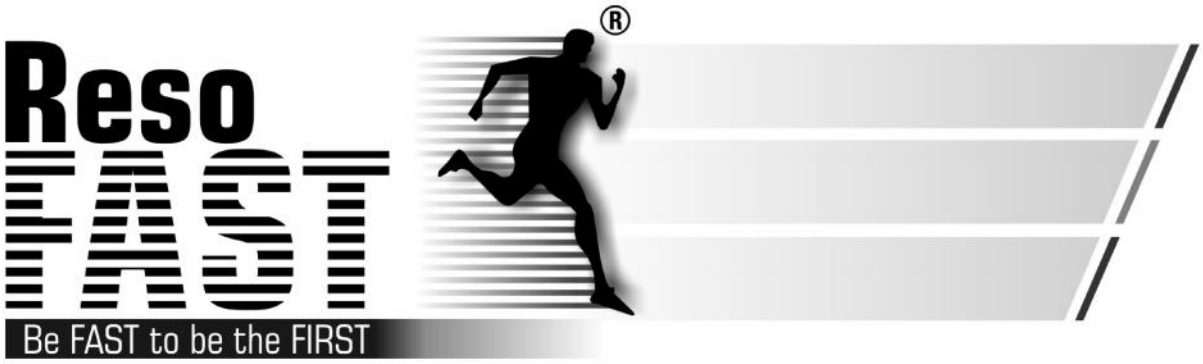
    (iii) Merit certificate and a prize in term to "National wise" Top 1% students.
15. Result sheet and the "Centre Top 10%" certificates will be dispatched to the Prof-in-charge of the centre by **February, 2017.**
16. List of students (with center number and roll number only) having score above MAS will be display on our website (www.iapt.org.in) by **22nd December, 2016**. See the **Eligibility Clause** in the Student's brochure on our website.
17. Students eligible for the INO Examination on the basis of selection criteria mentioned in Student's brochure will be informed accordingly.

Resonance Eduventures Ltd.
CORPORATE OFFICE : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005
Ph.No. : +91-744-3012222, 6635555 **| Toll Free :** 1800 258 5555
Reg. Office : J-2, Jawahar Nagar, Main Road, Kota (Raj.)-324005 **| Ph. No.:** +91-744-3192222 **|** FAX No. : +91-022-39167222
Website : www.resonance.ac.in **| E-mail :** contact@resonance.ac.in | **CIN:** U80302RJ2007PLC024029

Resonance®
Educating for better tomorrow

Academic Session: 2017-18

Resonance Forward Admission & Scholarship Test (ResoFAST)



ADMISSION ANNOUNCEMENT

Enroll Now for Academic Session 2017-18 @ Coaching Fee of 2016-17

Classroom Contact Programs for Class V to XII

Target: JEE (Main+Advanced) | JEE (Main) | AIIMS/ NEET | Pre-foundation

Academic Benefits*

More than **800** Academic Hours & **500** Classes

More than **15000** Academic Questions

More than **100** Testing Hours

Financial Benefits*

Upto ₹ **30000+** Saving on 1 Year Course Fee

50% Concession on Admission Form Fee

Upto **90%** Scholarship on Course Fee

* Tentative

Test Cities for ResoFAST - 2017

Test Dates: 27.11.2016, 11.12.2016

Study Center Cities (29): Rajasthan: Kota, Jaipur, Jodhpur, Udaipur, Ajmer, Sikar; **Bihar:** Patna; **Chattisgarh:** Raipur; **Delhi; Gujarat:** Ahmedabad, Surat, Rajkot, Vadodara; **Jharkhand:** Ranchi; **Madhya Pradesh:** Bhopal, Gwalior, Indore, Jabalpur; **Maharashtra:** Aurangabad, Mumbai, Nagpur, Nanded, Nashik, Chandrapur; **Odisha:** Bhubaneswar; **Uttar Pradesh:** Agra, Allahabad, Lucknow; **West Bengal:** Kolkata;

Test Dates: 25.12.2016, 15.01.2017

Study Center Cities (27): Rajasthan: Kota, Jaipur, Jodhpur, Udaipur; **Bihar:** Patna; **Chattisgarh:** Raipur; **Delhi; Gujarat:** Ahmedabad, Surat, Rajkot, Vadodara; **Jharkhand:** Ranchi; **Madhya Pradesh:** Bhopal, Gwalior, Indore, Jabalpur; **Maharashtra:** Aurangabad, Mumbai, Nagpur, Nanded, Nashik, Chandrapur; **Odisha:** Bhubaneswar; **Uttar Pradesh:** Agra, Allahabad, Lucknow; **West Bengal:** Kolkata;
Other Test Cities (74): Rajasthan: Ajmer, Sikar, Sri Ganganagar, Alwar, Bhilwara, Bikaner, Bharatpur, Churu, Abu Road, Barmer; **Bihar:** Arah, Bhagalpur, Purnia, Samastipur, Gaya, Sitamari, Nalanda, Begu Sarai, Madhubani, Muzzafarpur; **Delhi NCR:** Noida, Gurgaon, Faridabad, Ghaziabad; **Haryana:** Bhiwani, Rewari, Hisar, Kaithal, Mahendargarh; **Jharkhand:** Jamshedpur, Bokaro, Dhanbad; **J&K:** Jammu; **Madhya Pradesh:** Satna, Singhroli, Guna, Sahdol, Chattarpur; **Maharashtra:** Pune, Latur, Akola, Jalgaon, Sanghli; **North East:** Guwahati, Jalpaiguri; **Odisha:** Rourkela, Sambhalpur; **Punjab:** Amritsar, Jhalandhar, Bhatinda; **Uttarkhand:** Dehradun, Haldwani; **Uttar Pradesh:** Kanpur, Varanasi, Jhansi, Jaunpur, Bareily, Rai barely, Sultanpur, Saharanpur, Aligarh, Gorakhpur, Mathura, Rampur; **West Bengal:** Durgapura; **Gujrat:** Gandhinagar, Anand, Jamnagar, Vapi, Mehsana; **Chattisgarh:** Bilaspur, Bhillai; **Himachal Pradesh:** Mandi; Chandigarh;

HOW TO GET ADMISSION PACKET: (a) **Online:** Visit www.resonance.ac.in, and buy ONLINE by paying through Credit/Debit Card & Net Banking, | (b) **In Person:** Through Cash/ DD made in favour of 'Resonance', payable at Kota submit at any of the Resonance Study Centres. | (c) **By Post/ Courier:** Make a DD/Pay Order of required amount in favour of 'Resonance', payable at Kota and send it to at Kota only. | (d) COD (sms RESO Your City Name to 56677).

Resonance Eduventures Limited

CORPORATE OFFICE: CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005
Reg. Office: J-2, Jawahar Nagar Main Road, Kota (Raj.) - 05 | **Tel. No.:** 0744-3012100, 3012222, 6635555 | **CIN:** U80302RJ2007PLC024029

To know more: sms RESO at 56677 | e-mail: contact@resonance.ac.in

Toll Free: 1800 258 5555 | Visit us: www.resonance.ac.in

1. Nitrogen bend' avoided by diving mammals like whales because

(a) their blood has low partial pressure of Nitrogen at all time

(b) their lungs are filled with nitrogenous air before diving

(c) Peripheral circulation is minimal while diving

(d) they have very low metabolic rate while diving

Ans (c)

2. A frog' egg is centrifuged to disturb its contents. Which of the following is correct

(a) abnormal development may occur since the animal pole and vegetal pole are reversed

(b) abnormal development may occur since the grey crescent is shifted horizontally

(c) abnormal development may occur since the grey crescent is shifted horizontally

(d) abnormal development may occur since the heavier proteins are shifted to the vegetal pole

Ans (c)

3. The predator population in a habitat is an indicator of its health becauses

(a) Predator keep a check on the population of tertiary consumers

(b) predators control the consumption of primary consumers

(c) predators selectivly hunt the weaker members of consumers

(d) predators enhances population of decomposers

Ans (b)

4. The key events in embryo development are given below. Which is the correct order of sequences

(i) Organogenesis (ii) Fertilization

(iii) Gastrulation (iv) Neurulation

(v) Cleavage

(a) v $\rightarrow$ ii $\rightarrow$ iv $\rightarrow$ i $\rightarrow$ iii (b) ii $\rightarrow$ iii $\rightarrow$ v $\rightarrow$ i $\rightarrow$ iv

(c) iii $\rightarrow$ iv $\rightarrow$ ii $\rightarrow$ i $\rightarrow$ v (d) v $\rightarrow$ ii $\rightarrow$ iv $\rightarrow$ i $\rightarrow$ iii

Ans (d)

5. The molecules absorbed and secreted in the lumen by the cells of malpighain bodies of cockroach are respectively

(a) Sodium urate and urea (b) purines and ammonia

(c) urea and uric acid (d) ammonia and uric acid

Ans (c)

6. The least percentage of water is encountered in the

(a) fluid in convoluted tubule (b) filtrate in Bowman's capsule

(c) Blood plasma in glomerulusn (d) filtrate in renal capsule

Ans (a)

7. Some animals have adapted specific niche. In this specialization, some organs become well Developed at the expense of others that become vestigial

Select the correct match of the animals

No.	Specialized	Vestigeal Organ
I	Wings	Leg muscles
II	Well developed nose	Eyes
III	Elongated muscular body	Legs
IV	Legs	Wings

(a) I- Bat, II-python, III- mole, IV- ostrich

(b) I- Bat, II-mole, III- python, IV- ostrich

(c) I- Ostrich, II-python, III- mole, IV- bat

(d) I- Ostrich, II-mole, III- python, IV- bat

Ans (a)

8. Which of the following statements is incorrect

(a) cDNA is synthesized from mRNA

(b) cDNA laeks introns

(c) cDNA cannot be expressed outside a eukaryotic cell

(d) Size of cDNA is shorter than the orginal DNA in a eukaryotic cell

Ans (c)

9. The Km value of an enzyme substrate reaction is a measure affinity of the enzyme for its substrate. In presence of a competitive inhibitor, which of the following is true?

(a) the Km and Vmax will increase

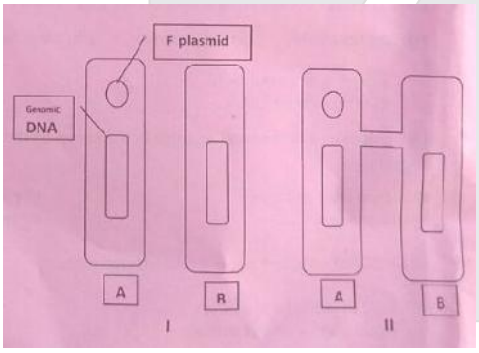
(b) the Km will increase but Vmax will remain unaltered

(c) the Km will remain same but Vmax increase

(d) The Km will remain same but Vmax will dcrease

Ans (b)

10. Two initial stages (I and II) of conjugation between Bacteria 'A' and 'B' are depicted below



Which of the events will follow

(a) Both strands of F plasmid will be transferred from A to B with A becoming F negative and B becoming F possitive

(b) Only one strand of F plasmid will be transferred from A to B complemntary strands will be synthesized making both cells F- positive

(c) Genomic DNA will be transferred from A to B and remains F-Positive while B remains F-negative

(d) Both genomic DNA and F plasmid will transferred form A to B. Consequenly, cell A dies

Ans (b)

11. If one arginine has molecular weight of 174 Daltons, then what would be the molecular weight (Daltons) of a linear polymer of 30 arginies

(a) 5760 (b) 5220 (c) 4698 (d) 4680

Ans (c)

12. A Few cells and associated entities are listed. Which of them represents the correct ascending order of the size relative to each other

(a) Mitochondrion < Paramecium < Human < erythrocyte < E. coli

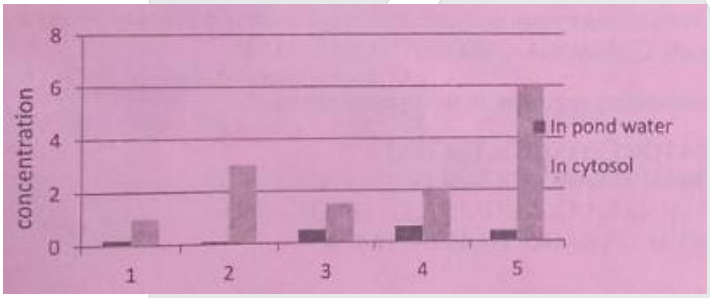
(b) Protein < Virus < Mitochondrion < Paramecium

(c) Chloroplast < Protein < Human sperm < frog egg

(d) Nueleus < protein < Paramecium < Chloroplast

Ans (a)

13. In the accompanying relative concentration of concentration of certain ions in water and in cytosol of the green alga Nitella has show, If 5 represents Cl^-, Which of the numbered bars in the figure represent Ca^{+2}, Mg^{+2}, Na^+ and K^+ respectively



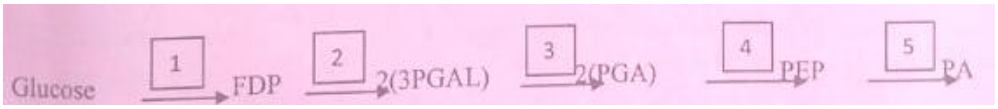
(a) 2, 3, 4 & 1 (b) 1, 2, 3 & 4

(c) 3, 2, 1 & 4 (d) 3, 4, 1 & 2

Ans (d)

14. The chemical transformations occurring in glycolysis can be summarized as follows

If NAD + is not available, the pathway will be blocked at the raction represented by



(a) 2 (b) 3 (c) 4 (d) 5

Ans (b)

15. In the accompanying diagram a single set of chromosomes is found in

i. Germinal cell ii. spermatogonium iii. primary spermatocyte

iv. Secondary Spermatocyte, v .Spermatid

(a) ii, iii, iv and v (b) i, iii , iv and v

(c) Only iv and v (d) Only v

Ans (c)

16. Which of the following structure is not found in a prokaryotic cell

i) Plasma membrane ii) Ribosomes iii) Endoplasmic reticulum

vi) Golgi bodies

(a) i and ii (b) ii only (c) iii only (d) iii and iv

Ans (d)

17. Which of the following is the key compound in the intermediary metabolism of carbohydrates, lipid and proteins

(a) PEP (b) PGA (c) Acetyl CoA (d) α-ketoglutarate

Ans (c)

18. Denudation of habitats by which of the following events leads to the fastest secondary succession

(a) Flood (b) Fire (c) Earthquake (d) Vocanic eruption

Ans (b)

19. Absence of oxygen will arrest which of the following

i. EMP Pathway ii. TCA cycle iii. Chemiosmosis coupling iv. lactate fermentation

(a) i, ii & iii (b) ii, iii & vi (c) Only i & iii (d) only ii & iii

Ans (d)

20. A researcher working with nucleic acids found out that the cytosine content in a mRNA molecule was 30% What will be the content of Adenie

(a) 20% (b) 30% (c) 40% (d) Can't be deduced

Ans (d)

21. A retrovius with a Revers transcriptase enzyme infects a eukaryotic cell and from a protein whose RNA reads as 5' AUCGACGAUACGAAAGCCGUACGCUAU3'

(a) 5' TAGCTGCTATGCTTTCGGCATGCATS 3'

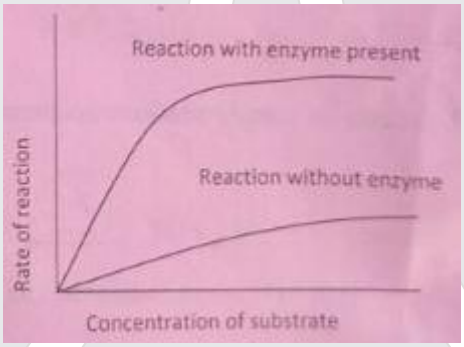
(b) 5' AUCGACGAUACGAAAGCCGUACGCUAU 3'

(c) 5' UAGCUGCUAUGCUUUGCCGAUGCGAUA 3'

(d) 5' ATCGACGATACGAAAGCCGTACGCTAT3'

Ans (b)

22. The graph below explains the correlation between the rate of reaction and concentration of can be seen that enzyme catalyses the raction to significant extent but after certain increase in substrate concentration, rate of reaction remains constant. This be because.



(a) At high substrate concentation, enzyme activity gets suppressed

(b) Enzymes activity is directly proportionate to the concentration of substrate

(c) There are no enough enzyme molecules to bind to bind to substrate for catalyzing the reaction at higher concentration

(d) Higher concentration of substrate can degrade the enzyme.

Ans (c)

23. A student could make out that a specimen he found in a lake was an arthropod but could not assign it to a class. The organism had two pairs antennae and compound eyes on stalk, It must belong to the class

(a) Crustacea (b) Arachnida (c) Insecta (d) Myriapoda

Ans (c)

24. Following are the biotic components of an ecosystem

(i) Primary produecrs

(ii) Primary consumers

(iii) Secondary consumers

(iv) Tertiary consumers

(v) Decomposers

The componnents without which an ecosystem can not exist is/ are

(a) ii, ii, iii, iv and v (b) i & v only (c) i & ii only (d) i only

Ans (b)

25. Assuming same body size, which of the following animals will have largest stomach?

(a) Dolphin (b) Llama (c) Leopard (d) Vulture

Ans (b)

26. Choose the correct combination of the animals 1 and 2 with the feature that differentiates them.

	Animal 1	**Animal 2**	**Feature**
(a)	Lizard	Tiger	Amniotic egg
(b)	Shark	Frog	Lungs
(c)	Tiger	Gorilla	Hair
(d)	Gorilla	Human	Loss of tail

Ans (b)

27. If the frequency of a dominant phenotype in a stable population is 75%, the frequency of recessive allele in that population would be,

(a) 0.375 (b) 0.25 (c) 0.75 (d) 0.50

Ans (b)

28. During a field trip, a zoology student collected some specimens, They tried identifying one of the specimens. To do this they observed and listed the following characteristics: Absence of special sense organs such as eyes, ability to withstand low oxygen levels and poorly developed nervous system. The specimen could most likely be:

(a) A free-living flatworm such as Planaria. (b) An ectoparasite like flea.

(c) A filter feeder like mollusk (d) An endoparasite like liver fluke

Ans (d)

29. Which one of the following genetic disorders can be detected by karyotyping?

(a) Down syndrome (b) Phenylketonuria

(c) Hemophilia (d) Huntington's disease

Ans (a)

30. In a test cross of F1 generation having a genotype AaBb, following progeny were obtained;

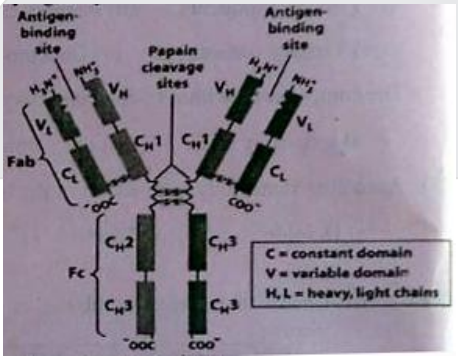
AaBb (450), aabb (450), Aabb (50), aaBb (50)

How far in centimorgans (cM) are the a and b genes?

(a) 100 (b) 90 (c) 10 (d) 1

Ans (c)

31. Immunoglobulin G molecule is shown in the accompanying diagram. If it is treated with mercapto-ethanol (reducing agent)



Result will be the production of:

(a) Single peptide molecule without affinity for antigen

(b) Total of four polypeptide chains

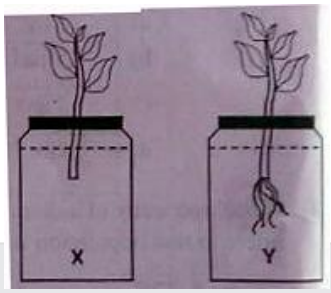
(c) Two polypeptide chains one with Fab portion & another with Fe

(d) Six fragments with each with either Fe or Fab region

Ans (b)

32. The cut stem of two identical branches of the same mother plant were inserted in bottles containing liquid X and Y for a week to show the result as seen in the accompanying diagram.

The liquid 'X' an 'Y' may be:



(a) Water and physiologically balanced solution.

(b) Water and weak solution of abscisic acid.

(c) Water and weak solution of auxin.

(d) Weak salt solution and weak solution of ehtylene.

Ans (b)

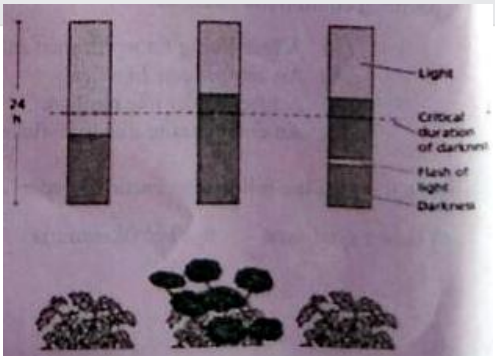
33. Which of the extra-embryonic membranes is/are involved in the gaseous exchange of the embryo?

i. Amnion ii. Chorion iii. Allantois iv. Yolk sac

(a) i, ii and iii (b) i, iii and iv (c) Only i and iii (d) Only ii and iii

Ans (d)

34. In the accompanying figure the exposure of plant to cycles of light and darkness along with the following responses has been shown. The plant must be a-



(a) Long day plant (b) Short day plant

(c) Day neutral plant (d) Gibberellins treated plant

Ans (b)

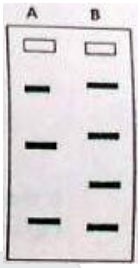
35. PBR322 (A) is a plasmid having two restriction sites for EcoRI while T4 phage DNA (B) has three restriction sites for it. These two DNA were treated with EcoRI and allowed to run on agarose gel.

Which of th following correctly depicts teh EcoRI digested gel pattern?

(a) 

(b) 

(c) 

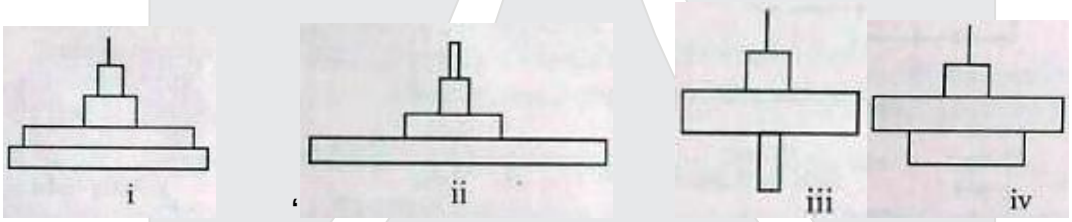
(d) 

Ans (c)

36. Starvation proteins are synthesized by the bacteria at the onset of carbon starvation. These are produced by a bacteria during which of the following stages of growth curve?

(a) Lag phase (b) Exponential phase (c) Stationary phase (d) Death phase

Ans (c)

37. 

The pyramid of numbers for marine ecosystem, tropical deciduous forest, grassland and temperate forest are depicted above. Arrange the pyramids in the order of ecosystems mentioned above.

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

Ans (a)

38. Stratified squamous epithelium is found in the lining of:

(a) nasal passage (b) urethra (c) oesophagus (d) blood vessels

Ans (c)

39. Fire play critical roles in development of grasslands. Fire selects against plants with

(a) Basal meristems not easily destroyed by fire / grazers

(b) permanent above ground parts

(c) Structures for vegetative propagation

(d) Underground storage organs

Ans (b)

40. In which of the following, hydrogen bonding is involved?

i. Water molecule and other polar molecule

ii. DNA and RNA (during transcription)

iii. Metal ion and chelating agent

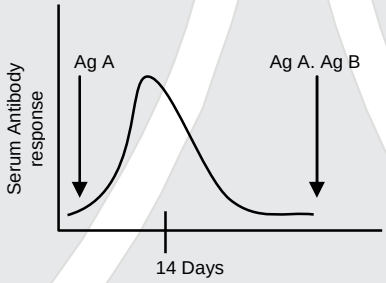
iv. Amino acid residues in a helix of a polypeptide

v. Electron deficient and electron surplus atoms

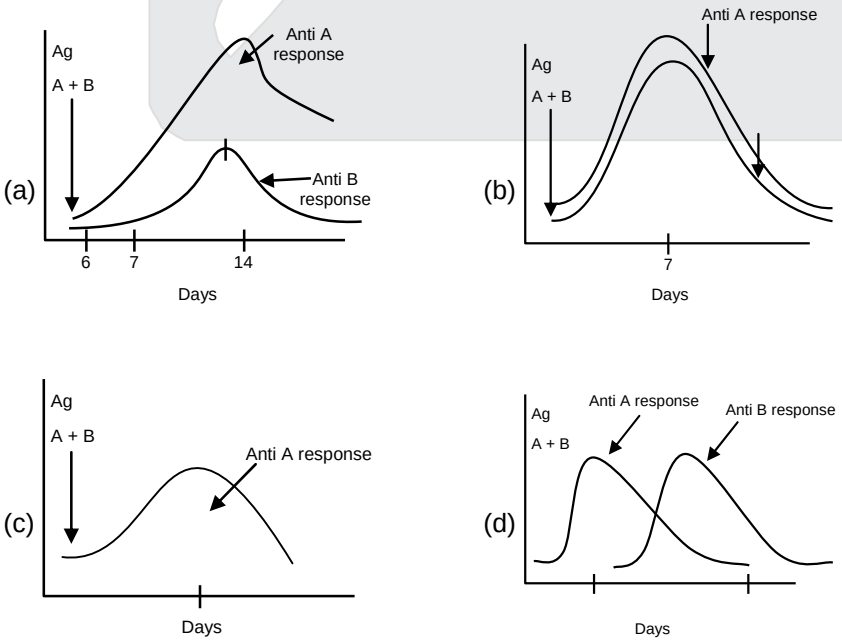
(a) i, ii, iii & iv (b) i, iii, iv & v (c) only i, iv & v (d) only i, ii & iv

Ans (d)

41. When an animal is injected with an antigen A, it produce antibody response as shown:



If the same animal is now injected with a mixture of antigen A and B (shown by arrow) the expected response following the injection would be:



Ans (d)

42. Though the earliest evolved life forms were anaerobic, there was an eventual predominance of aerobe on earth. Which of the following is the most likely reason for it?

(a) Evolution of mitochondria and eukaryotic organization.

(b) Evolution of photosynthetic organisms.

(c) Evolution of heterotrophic organisms.

(d) Evolution of terrestrial organisms.

Ans (b)

43. Colonization of land by plants was associated with the evolution of structures of obtain water and to minimize water loss. Which of the following adaptation are associated with the latter?

i. Development of epidermis with waxy cuticle.

ii. Development of stomata with elaborate opening and closing mechanism.

iii. Development of bark on old stem and roots.

(a) i and ii only (b) i only (c) ii an iii only (d) i, ii and iii

Ans (a)

44. Fats and oils are the most preferred reserved foods. Choose the correct combination of statements given below to support this:

i. They have density lower than most other molecules in a cell.

ii. Their complete oxidation release energy greater than other organic polymers.

iii. Being hydrophobic they get clustered and use lesser space for storage.

iv. Being heteropolymeric they are the most convenient storage foods.

(a) ii & iii (b) i & ii (c) i & iv (d) iii & iv

Ans (a)

45. The secondary structure of protein mainly owe to the amino acids that have :

(a) sulfhydryl group (b) aromatic group

(c) alkaline side chain (d) acidic side chain

Ans (d)

46. Which combination of statements correctly relates to the stress exerted by excess of sodium chloride in the soil on the plants?

i. Salt lower the water potential of soil.

ii. Salt lowers the pH of soil.

iii. Excess sodium ions exert a toxic influence.

iv. Organic contents of root hair cells make the water potential less negative than that of soil.

v. Organic content of root hair cells make the water potential less negative than that of soil.

(a) i, iii an v (b) ii, iv an v (c) i, iii and iv (d) ii, iii and iv

Ans (a)

47. A male English Robin attacks a bundle of red feathers placed in it territory but ignores a stuffed non-red juvenile. This is an example of:

i. Fixed action pattern ii. Learned behaviour iii. Learned behaviour

iv. Reflex action pattern v. Cognitive behaviour

(a) i, iii and v (b) i & ii only (c) i & iv only (d) only iii

Ans (c)

48. A few examples of transport across cell membrane are listed below. Which of them occur by direct passive diffusion?

(a) Movement of oxygen molecules into cells.

(b) Movement of sodium ion against its concentration gradient.

(c) Uptake of cholesterol by cells.

(d) Secretion of mucus by cells.

Ans (a)

49. The interaction between actin an myosin generates the force for all of the following except:

(a) Cytoplasmic streaming in a cell of *Chara.*

(b) Wriggling movement of an earthworm.

(c) Closure of leaflet of "touch-me-not" plant.

(d) Swallowing of food in man.

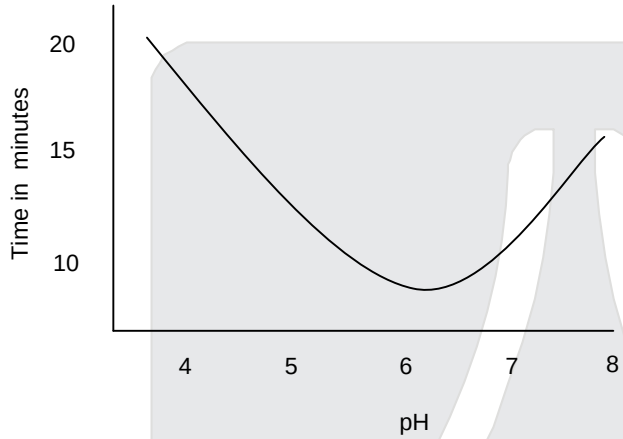
Ans (c)

50. Which of the cellular organelles mentioned below have to import all the proteins they contains?

(a) Nucleus (b) Lysosomes (c) Chloroplast (d) Mitochondria

Ans (b)

51. While studying enzyme activity, Neeta added 1 cm^3 of catalase enzyme to fixed volume of hydrogen peroxide solution at different pH values. The time taken to collect 10 cm^3 of oxygen was measured. The results are plotted on the graph as shown below.



From the graph it can be concluded that:

(a) pH of the solution and time taken for collection of gas are inversely proportional

(b) The rate of reaction is highest at pH 4 and 8.

(c) If the rate of reaction is plotted against pH, the graph will look similar.

(d) The pattern of graph will remain same if quantity of catalase is doubled.

Ans (d)

52. Curling or straightening hair using various physical and chemical processes is common for reshaping the hair. Which of the following is true?

(a) Curling the straight hair requires to form new SH bonds in hair keratin.

(b) Straightened hair has fewer SH bonds than their natural counterpart.

(c) Both curling & straightening requires breaking and making of sH bonds.

(d) Hydrogen peroxide treatment on hair helps in breaking and making of SH bonds.

Ans (b)

53. Which of the following may result in allopatric speciation?

(a) Rising sea levels submerging islands

(b) Polluted waters destroying coral reefs

(c) Torrential rains changing course of wide rivers

(d) Uncontrolled logging destroying forests.

Ans (c)

54. Hydrophobic interaction influence protein structure at which of the following level/s?

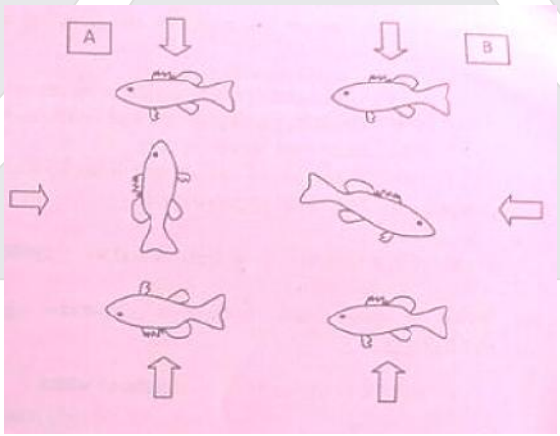
(i) Primary structure (ii) Secondary structure

(iii) Tertiary structure (iv) Quaternary structure

(a) i and ii (b) ii and iii (c) iii and iv (d) ii and iv.

Ans (c)

55. Fish normally swim with dorsal surface towards light. Two fish A and B showed following response to light. Mark correct interpretation. (Arrow indicates light source.)



(a) B is normal fish & A with gravity sensor removed.

(b) B is normal fish & A with one eye removed.

(c) B is normal fish & A with photoreceptor dysfunction (unequal stimulation).

(d)A has gravity sensor dominant over light sensor & B light sensor dominant over gravity sensor.

Ans (a)

56. In a cloning experiment, DNA ligase used shows optimum activity at 37^0C and a segment of DNA that needs to be ligated shows 18^0C as its Tm (melting temperature). Which of the following conditions will give best results of the ligation experiment?

(a) Experiment performed between 18^0C and 37^0C

(b) Experiment quickly performed at 18^0C

(c) Experiment performed at temp above 18^0C but less than 37^0C.

(d) Experiment performed at 8-10^0C temp over a prolonged period.

Ans (d)

57. The difference between excitatory and inhibitory response across a synapse is mainly due to:

i. Intensity of voltage through synaptic space

ii. Type of neurotransmitter

iii. Type of gated channel opened in response to neurotransmitter

(a) i, ii and iii (b) i and ii only (c) i and iii only (d) ii and iii only.

Ans (d)

58. If a fluorescing protein is attached to many free ribosomes in a cell and the cell is photographed after a time interval, the colour will appear:

(a) in cytoplasm only

(b) in cytoplasm and along rough endoplasmic reticulum.

(c) in cytoplasm, along rough endoplasmic reticulum and along wall of nucleus

(d) in cytoplasm, along rough endoplasmic reticulum, along wall of nucleus and in the matrix of mitochondria.

Ans (c)

59. Choose the statements that represent the effect of adrenal activation through sympathetic stimulation due to stress.

i. Glycogenolysis resulting in increased blood glucose

ii. Breakdown of proteins and lipids leading to gluconeogenesis

iii. Increased breathing rate

iv. Retention of sodium and water by kidneys

v. Increased metabolic rate

(a) i, ii, iv and v (b) i, iii, iv and v (c) only iii and v (d) only i and iii

Ans (d)

60. When a plant cell undergoes expensive growth, the increase in volume is caused mostly:

(a) uptake of minerals (b) uptake of water

(c) synthesis of cellulose (d) synthesis of proteins

Ans (b)

61. In temperate ponds many short-lived zooplanktonic species show morphological variations in successive generations. These are referred to as the ecotypes of the respective species. They are the reflections of:

(a) Directional mutations (b) Adaptations to physical environment

(c) Population fluctuations (d) Gene flow

Ans (b)

62. Which of the following processes are involved in sympatric speciation?

(i) Reduced interactions between populations.

(ii) Niche separation

(iii) Divergent evolution

(iv) Convergent evolution

(a) ii & iii only (b) i & iv only (c) ii and iv only (d) i, ii & iii only

Ans (d)

63. When fresh extract of leaves of *Bryophyllum* dissolves calcium carbonate. What is the ideal time to collect the leaves to be most effective?

(a) Before daybreak (b) Early hours of day

(c) At sunset (d) Late evening

Ans (a)

64. When the fruit of a specific plant species were collected they exhibited a variation in weight. The weight categories were 20, 25, 30, 35 and 40 grams. If it is a polygene inheritance, how many gene loci are involved?

(a) 2 (b) 3 (c) 4 (d) 5

Ans (a)

65. The excessive CO_2 being released in the atmosphere through the combustion of fuels is largely absorbed by seas and oceans thus restricting the greenhouse effect and global warming. Choose the appropriate combination of the biological processes that helps in minimizing global warming.

i. Photosynthesis by phytoplanktonic species

ii. Deposition of marl and compaction into limestone

iii. Diagenesis of organic sediment into mineral oils

iv. Formation of exoskeleton by marine organisms

(a) i, ii & iv (b) i, ii & iii (c) Only i & ii (d) Only i and iv

Ans (a)

66. An alga with cells lacking centrioles, flagella and having Floridian starch as reserved food has to be a

(a) Green alga (b) Blue green alga (c) Red alga (d) Brown alga

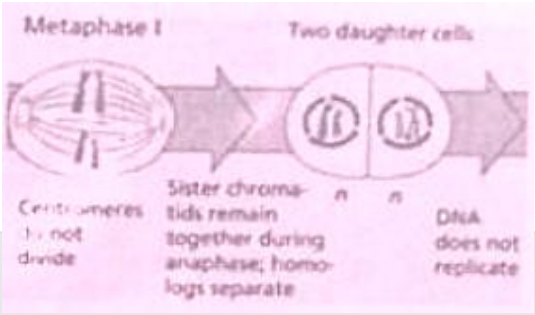
Ans (c)

67. Reclamation of which of the following habitats by dumping debris is sure to increase global warming?

(a) Seas (b) Peat lands (c) Temporary ponds (d) Streams

Ans (a)

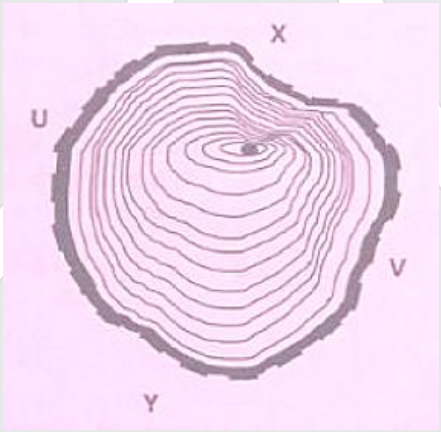
68. Study the given illustration of a cell division. In which organ of the human body would this process take place?



(a) Liver (b) Spleen (c) Bone marrow (d) Gonad

Ans (d)

69. From the T.S. of trunk shown in the diagram it can be predicted that the corresponding branch must be



(a) Bent in the direction of 'X'

(b) Bent in the direction of 'Y'

(c) Twisted through U $\rightarrow$ V axis

(d) Bearing the beating of wind and rain in Y $\rightarrow$ X direction

Ans (b)

70. The role of luteinizing hormone (LH) in human male is:

(a) Blocking the release of GnRH from pituitary.

(b) Stimulating Sertoli cells to promote spermatogenesis.

(c) Stimulating Leydig's cells to produce testosterone.

(d) Modifying the signal produced by FSH in seminiferous tubule

Ans (c)

71. Transcriptional activity of genes is regulated by promoter & enhancer sequences. Which of the following descriptions is correct?

i. Promoter sequences are always *cis* acting while enhancer sequences can be *trans* acting

ii. Both are located upstream from the structural gene that they regulate

iii. TATA box is one type of promoter sequence

iv. of promoter sequence is controlled by transcription factors which are small RNA sequences

(a) i & ii only (b) Only iii & iv (c) i & iv only (d) iii only

Ans (d)

72. Consider an ecosystem where diatoms, copepods and small fish coexist. Which of the following statements is/are correct?

i. The biomass pyramid of this ecosystem is likely to be inverted.

ii. The number pyramid of this ecosystem is likely to be upright.

iii. The energy pyramid of this ecosystem can be inverted depending on the season on the year.

(a) i only (b) i & iii only (c) ii only (d) iii only

Ans (a)

73. Which of the following defenses of the body against foreign particles constitute innate immunity?

(i) Antimicrobial proteins (ii) Mucous membrane (iii) Antibodies
(iv) Phagocytic cells (v) Inflammatory response (vi) Cytotoxic lymphocytes

(a) i, iii, iv and v (b) ii, iv, v and vi (c) iii, iv, v and vi (d) i, ii, iv and v

Ans (d)

74. Arrange the following biomolecules in an increasing order of rate of passing through plasma membrane:

(i) Triglycerides (ii) Fructose (iii) Na^+ (iv) Urea

(a) ii < iv < i < iii (b) iii < ii < iv < i (c) i < ii < iv < iii (d) ii < iii < iv < i

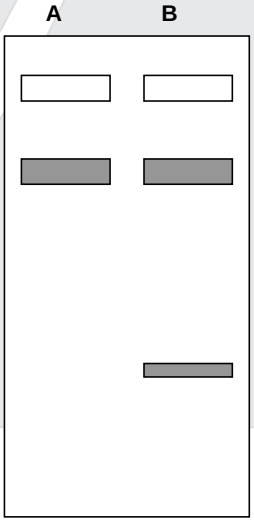
Ans (c)

75. Gel electrophoresis of DNA of two bacterial strains A & B is done. It showed band pattern as follows. What could be the probable reason/s for two DNA bands in strain B:

i. DNA in strain B is fragmented while extraction.

ii. DNA in strain B is duplicated.

iii. Strain B is harboring plasmid DNA.



(a) i, ii & iii (b) i & iii (c) only i (d) only iii

Ans (b)

76. A botanist collected leaf specimen from two different plants (I and II). He then took transverse sections of both the specimens, stained and observed them under the microscope. The observations are tabulated below.

Leaf from plant	Stomata on		Cuticle		Air spaces
	Upper epidermis	Lower epidermis	Upper epidermis	Lower epidermis	
I	Present	Absent	Present	Absent	Present
II	Absent	Present	Present	Present	Absent

The plants I and II could respectively represent:

(a) Xerophyte and Mesophyte

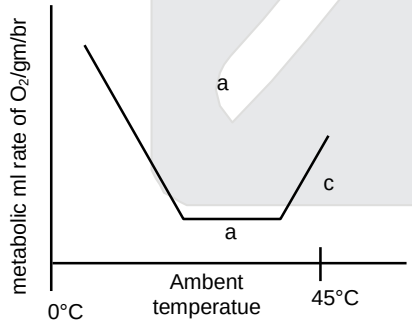
(b) Xerophyte and Floating hydrophyte

(c) Mesophyte and Submerged hydrophyte

(d) Floating hydrophyte and Xerophyte

Ans (d)

77. Temperature related metabolic response of an animal is shown in the accompanying graph. Which of the following is the correct description of regions a, b or c:



(a) Energy expended to lose excess heat : b + c

(b) Energy required to maintain body temperature: a

(c) Endothermy : b & ectothermy: a

(d) Heterothermy : a, b, & c

Ans (d)

78. For an unclothed man, following are the skin & rectal temperature when ambient temperature is 30° C

t_s : 30° C t_{skin} : 34°C t_{rectal} : 37.1°C

What will be the temperatures when ambient temperature is 20°C & 40°C respectively?

(a) t_{skin} : 32°C t_{rectal} : 37.1°C and T_{skin} 36°C t_{rectal} : 37.2°C

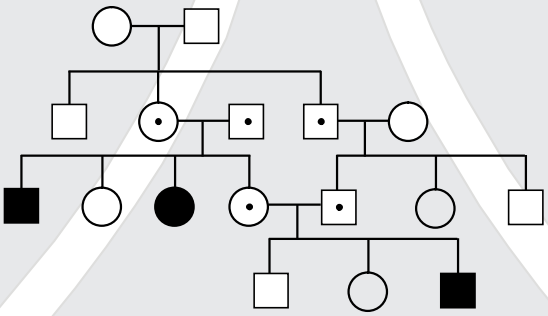
(b) t_{skin} : 32°C t_{rectal} : 35.1°C and T_{skin} 36°C t_{rectal} : 39.1°C

(c) t_{skin} : 20°C t_{rectal} : 35°C and T_{skin} 40°C t_{rectal} : 39°C

(d) t_{skin} : 34°C t_{rectal} : 37.1°C and T_{skin} 34°C t_{rectal} : 37.1°C

Ans (d)

79. A pedigree depicting the inheritance of a trait in a family is shown.



The trait represent is :

(a) Autosomal dominant (b) Autosomal recessive

(c) X-linked recessive (d) Y-linked

Ans (b)

80. Separation of DNA fragments using agarose gel electrophoresis occurs due to :

(a) Difference in the sequence of the fragments.

(b) Presence of different charges on the fragments.

(c) Difference in the staining properties of the fragments.

(d) Difference in the sizes of the fragments.

Ans (d)

Resonance®
Educating for better tomorrow

ADMISSION OPEN
for Academic Session: 2017-18

Result @ Resonance

JEE (Adv.) 2016
5111
CCP: **3554** | DLP/ e-LP: **1557**

JEE (Main) 2016
28090
CCP: **20429** | DLP/ e-LP: **7661**

AIIMS 2016
213
CCP: **32** | DLP/ e-LP: **181**

NEET 2016
1787
CCP: **1155** | DLP/ e-LP: **632**

Resonance's Forward Admission & Scholarship Test (ResoFAST)

Reso FAST®
Be FAST to be the FIRST

For Classes: V to XII

Target: JEE (Main+Advanced) | **JEE** (Main)
AIIMS/ NEET | BOARD/ IJSO/ NTSE

Enroll Now for Academic Session 2017-18 @ Coaching Fee of 2016-17

Academic Benefits*

More than **800** Academic Hours & **500** Classes

More than **15000** Academic Questions

More than **100** Testing Hours

Financial Benefits*

Upto ₹ **30000+** Saving on 1 Year Course Fee

50% Concession on Admission Form Fee

Upto **90%** Scholarship on Course Fee

* Tentative

Test Dates

27th Nov 16 | 11th Dec 16 | 25th Dec 16 | 15th Jan 17

Resonance Eduventures Limited

CORPORATE OFFICE: CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005 | **Tel. No.:** 0744-3012100, 3012222, 6635555
To Know more: sms **RESO** at **56677** | **E-mail:** contact@resonance.ac.in | **Website:** www.resonance.ac.in | **CIN:** U80302RJ2007PLC024029