IIT-JAM BIOTECHNOLOGY - BT

TEST : CELL BIOLOGY

Time : 60 Minutes **Date : 29-07-2017**

M.M. : 65

INSTRUCTION:

- **Part-A** contains **15** Multiple Choice Questions (MCQ). Each question has 4 choices (a), (b), (c) and (d), for its answer, out of which **ONLY ONE** is correct. For each correct answer you will be awarded **3 marks**. For each incorrect answered **1 mark** will be deducted.
- **Part-B** contains **5** Multiple Select Questions (MSQ). Each question has 4 choices (a), (b), (c) and (d) for its answer, out of which **ONE or MORE than ONE** is/are correct. For each correct answer you will be awarded **2 marks**, there is no negative marking in this section.
- **Part-C** contains **5** Numerical Answer Type (NAT) questions which contain **2 Marks** for each, and there is no negative marking.

PART-A [Multiple Choice Questions]

1. Membranes of the following two organelles are contiguous.
   (a) ER and golgi (b) nucleus and ER
   (c) golgi and plasma membrane (d) golgi and lysosomes
2. The oligosacharadie part of glycoproteins is either N-linked or)-linked. The amino acid residues through which these oligosachharides are attached to polypeptides are-
   (a) Ser and Lys (b) Gly and ser
   (c) Asp and ser (d) Asn and ser
3. On the active ribosome, the polypeptide chain is synthesized-
   (A) From C termionus to N terminus (B)From N terminus to C- terminus
   (C) In variable direction depending on protein (D) From 5' end to 3'end
   (a) B and C (b) A and C
   (c) B only (d) A only
4. The KDEL sequence found on luminal proteins of the ER is responsible for
   (a) Transloaction of proteins into the ER lumen
   (b) Recognition by signal peptidase of the signal sequence
   (c) Retrieval of ER luminal proteins from the golgi
   (d) Insertion of proteins into the membrane of ER

5. Serpentine receptors are-
   (A) ion channels
   (B) act in the nucleus
   (C) have single transmembrane domain
   (D) are lacated on the plasma membrane
   find out the correct one.
   (a) C and D (b) Only C
   (c) Only D (d) A and D

6. Match the following-

A. Gated translocation	P. GB to lysososme
B. Transmembrane transloaction	Q. Cytosole to ER
C. Vesicular transport	R. Cytosole to nucleus

   (a) A-P, B-Q, C-R (b) A-R, B-P, C-Q
   (c) A-Q, B-P, C-R (d) A-R, B-Q, C-P

7. Large subunit (50S) of 70S ribosome consist of-
   (a) 16s rRNA and 21 proteins (b) 5s, 23s rRNA, 49 proteins
   (c) 5s, 23s rRNA, 32 proteins (d) 16s rRNA and 33 proteins

8. The signal sequence at the **C- terminal** of the proteins-
   (a) Always cleavable (b) Always noncleavable
   (c) cleavable or noncleavable (d) always noncleavable

9. When cells are disrupted by homogenization and ER is breaks into fragments and reseales into small vesicles, called-
   (a) Spherosomes (b) Mesososomes
   (c) Melanosomes (d) Microsomes

10. Which one true for Nitric oxide signaling-
   (a) Vascular endothelial cell- Arg + O2 = NO + citruline
   (b) Vascular endothelial cell- Asn + O2 = NO + citruline
   (c) Smooth muscle- Arg + O2 = NO + citruline
   (d) Smooth muscle- Asn + O2 = NO + citruline

11. Which of the following combination is true-
   (A) TGF-beta and BMP are examples of RAS-MAP Kinase pathway
   (B) Epidermal growth factor is example of Serine threonine kinase pathway
   (C) Insulin activate RTK and then GLUT-4 express in membrane and then comes hypoglycemic effect comes.
   (D) If mutation occurs in ras protein and glycine at the 12^{th} position is replace by any other protein then, ras losses its GTPase activity.
   (a) All are correct (b) A, B, C
   (c) A, C, D (d) C, D

12. Disease associated with the mutation in ABNC transporter is-
   (a) Cistric fibrosis (b) Glycogen storage dise
   (c) Tay sach diseae (d) Hungtington chorea

13. The enzyme that breaks down H_2O_2 into H2O and O2 in animal cells is usually found in which one of the following intracellular organelles.
    (a) ER (b) Golgi
    (c) Peroxisomes (d) Lsysosomes
14. Gaucher's disease is caused due to deficiency of
    (a) glucocerebrosidase (b) streptokinase
    (c) uricase (d) gangliosidase
15. Which of the following is the ideal molecular marker of a mature lysosome?
    (a) glucose 6 p receptor (b) SRP
    (c) mannose 6 p receptor (d) Mannose receptor

PART-B [Multiple Select Questions]

16. Find out the incorrect statements-
    (a) In O-linked glycosylation, sugars are attached to the protein via O-glycosidic bonds to the carboxyl groups of Asp and Glu.
    (b) In o-linked glycosylation performed oligosaccharides are attached to the relavant protein.
    (c) In o-linked glycosylation, N-acetylgalactosamine is added via O-glycosidic bonds to the OH groups of ser and thr after which other sugars are added sequentially
    (d) O-linked glucosylation is inhibited by the passage of newly synthesized protein through the golgi complex.
17. Plant vacuoles-
    (a) have acedic PH (b) maintain turgour pressure
    (c) perform autophagy and solute accumulation (d) perform heterophagy
18. Which of the following are true about transport vesicles-
    (a) COPII vesicles transport proteins from the rough ER to the Golgi
    (b) Clatherin coated vesicles transport proteins from the trans golgi to late endosome
    (c) COPII vesicles transport proteins between golgi cisternae and from the cis golgi back to the ER
    (d) GTPase that acts as a regulatory subunit to control coat assembly for both COPI and clatherin vesicles are ARF
19. Read the following statements carefully and choose the correct statements-
    (a) Tunicamycin blocks the first step of N- glycosylation.
    (b) Glycogen-sachharyl transferase the complete oligosachharide to asparagine side chain on nascent polypeptide.
    (c) Dolicol phosphate is long chain saturated isoprenoid alcohol with pyrophosphate.
    (d) SRP is cytosolic ribonucleoprotein with 7SLSc RNA of around 300 nucleotide and six proteins
20. Which is the minatory mechanism of response terminator in GPCR signaling-
    (a) Removal of ligand (b) GTPase activity
    (c) Increase phosphodiesterase (d) Desensetisation

PART-C [Numerical Answer Type]

21. There are some Bcl-2 family proteins which are involve in Apoptosis namely- Bax, Bak, PUMA, NOXA, Bim, Bid, Bad,BclXL, Bcl-2. Out of these proteins how many are consider under antiapoptotic ____
22. The assembly of _____ ribosome(in Svedberg units) in prokaryotes requires joining of 50 S and 30 S ribosomal subunits.
23. If the length of central alpha helix of integral protein is 3 nm then what will be the no. of amino acids of central alpha helix of that integral protein? _____
24. If an oraganism has a diploid number of 8, how many chromatids are present during prophase(begening) of mitosis? _____
25. The total no. of protofilaments present in 11 triplet of flagella? _____

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ANSWER KEY

PART-A [Multiple Choice Questions]

1. (b)	**2.** (d)	**3.** (c)	**4.** (c)	**5.** (c)
6. (d)	**7.** (c)	**8.** (d)	**9.** (d)	**10.** (a)
11. (d)	**12.** (a)	**13.** (c)	**14.** (a)	**15.** (c)

PART-B [Multiple Select Questions]

16. (a, b, d)	**17.** (a, b, c)	**18.** (a, b, d)	**19.** (a, d)
20. (a, b, c, d)			

PART-C [Numerical Answer Type]

21. (2)	**22.** (70)	**23.** (20)	**24.** (16)	**25.** (363)