

DU PhD in Microbiology

Topic:- DU\_J18\_PHD\_MICRO

**1) The yoghurt preparation requires the presence of 1:1 ratio of the following microorganisms:**

**[Question ID = 52175]**

1. *Streptococcus thermophilus* and *Lactobacillus bulgaricus* [Option ID = 88692]
2. *Streptococcus thermophilus* and *Lactococcus diacetylactis* [Option ID = 88693]
3. *Lactococcus lactis* and *Streptococcus thermophilus* [Option ID = 88695]
4. *Lactococcus diacetylactis* and *Lactobacillus bulgaricus* [Option ID = 88694]

**Correct Answer :-**

- *Streptococcus thermophilus* and *Lactobacillus bulgaricus* [Option ID = 88692]

**2) The DNA chain acting as a template for *in vitro* RNA synthesis has the sequence 5' - AGTCTTAATCCTG -3'. What is the sequence of the synthesized mRNA?**

**[Question ID = 52169]**

1. 5' CAGGATTAAGACT [Option ID = 88668]
2. 5' CAGGAUUAAGACU [Option ID = 88671]
3. 5' UCAGAAUUAGGAC [Option ID = 88670]
4. 5' TCAGAATTAGGAC [Option ID = 88669]

**Correct Answer :-**

- 5' CAGGAUUAAGACU [Option ID = 88671]

**3) The relationship between genomes of helper virus and satellite virus is best explained as:**

**[Question ID = 52198]**

1. Satellite virus originated from helper virus [Option ID = 88784]
2. Satellite viruses have no homology to helper virus [Option ID = 88786]
3. Helper virus originated from satellite virus [Option ID = 88785]
4. None of these [Option ID = 88787]

**Correct Answer :-**

- Satellite viruses have no homology to helper virus [Option ID = 88786]

**4) The bright orange color of cheddar cheese is due to the presence of following seed extract:**

**[Question ID = 52166]**

1. *Humulus lupulus* seed [Option ID = 88657]
2. *Annatto* and *Humulus lupulus* seed [Option ID = 88659]
3. *Annatto* seed [Option ID = 88656]
4. Dill seeds [Option ID = 88658]

**Correct Answer :-**

- *Annatto* seed [Option ID = 88656]

**5) The rate of sedimentation of spherical particles suspended in a fluid of Newtonian viscosity:**

**[Question ID = 52191]**

1. Inversely proportional to the square of the particle density [Option ID = 88759]
2. Inversely proportional to the square of the diameter of the particles [Option ID = 88757]
3. Inversely proportional to the square of the gravitational constant [Option ID = 88758]
4. Directly proportional to the square of the diameter of the particles [Option ID = 88756]

**Correct Answer :-**

- Directly proportional to the square of the diameter of the particles [Option ID = 88756]

**6) The rate of flow during gravity based batch filtration is:**

**[Question ID = 52205]**

1. Inversely proportional to the depth of filter bed [Option ID = 88813]
2. Inversely proportional to the area of filter bed exposed to liquid [Option ID = 88815]
3. Directly proportional to the depth of filter bed [Option ID = 88812]
4. Directly proportional to the area of filter bed exposed to liquid [Option ID = 88814]

**Correct Answer :-**

- Inversely proportional to the depth of filter bed [Option ID = 88813]

**7) The mRNA will form hybrids only with the coding strand of DNA because:**

**[Question ID = 52206]**

1. The salt concentration will affect DNA re-annealing [Option ID = 88817]
2. DNA will not re-anneal at low temperatures [Option ID = 88818]
3. DNA will not re-anneal at high temperatures [Option ID = 88816]
4. RNA:DNA hybridization follows the base-pairing rules [Option ID = 88819]

**Correct Answer :-**

- RNA:DNA hybridization follows the base-pairing rules [Option ID = 88819]

**8) The optimum biotin concentration in the growth medium of *Corynebacterium glutamicum* will help in excretion of:**

**[Question ID = 52202]**

1. Acetate [Option ID = 88803]
2. Aspartate [Option ID = 88802]
3. Lactate [Option ID = 88801]
4. Glutamate [Option ID = 88800]

**Correct Answer :-**

- Lactate [Option ID = 88801]

**9) The causative agent of syphilis, a sexually transmitted disease (STD):**

**[Question ID = 52186]**

1. *Neisseria* sp. [Option ID = 88737]
2. *Borrelia burgdorferi* [Option ID = 88739]
3. *Treponema pallidum* [Option ID = 88738]
4. *Gonorrhea* sp. [Option ID = 88736]

**Correct Answer :-**

- *Treponema pallidum* [Option ID = 88738]

**10) Who were awarded the Nobel prize in 1962 for discovering the structure of DNA?**

**[Question ID = 53375]**

1. Watson and Crick [Option ID = 93486]
2. Watson, Crick and Wilkins [Option ID = 93489]
3. Watson, Crick and Pauling [Option ID = 93488]
4. Watson, Crick and Franklin [Option ID = 93487]

**Correct Answer :-**

- Watson, Crick and Wilkins [Option ID = 93489]

**11) In positive control in an inducible operon, indicate whether the protein produced by the regulator gene will be synthesized initially as:**

**[Question ID = 52162]**

1. an active repressor [Option ID = 88640]
2. an active activator [Option ID = 88642]
3. an inactive activator. [Option ID = 88643]

4. an inactive repressor [Option ID = 88641]

**Correct Answer :-**

- an inactive activator. [Option ID = 88643]

**12) In positive control in a repressible operon, indicate whether the protein produced by the regulator gene will be synthesized initially as:**

**[Question ID = 52160]**

1. an active repressor [Option ID = 88632]
2. an active activator [Option ID = 88634]
3. an inactive activator. [Option ID = 88635]
4. an inactive repressor [Option ID = 88633]

**Correct Answer :-**

- an active activator [Option ID = 88634]

**13) In negative control in an inducible operon, indicate whether the protein produced by the regulator gene will be synthesized initially as:**

**[Question ID = 52163]**

1. an active repressor [Option ID = 88644]
2. an active activator [Option ID = 88646]
3. an inactive activator. [Option ID = 88647]
4. an inactive repressor [Option ID = 88645]

**Correct Answer :-**

- an active repressor [Option ID = 88644]

**14) In negative control in a repressible operon, indicate whether the protein produced by the regulator gene will be synthesized initially as:**

**[Question ID = 52161]**

1. an active repressor [Option ID = 88636]
2. an active activator [Option ID = 88638]
3. an inactive activator. [Option ID = 88639]
4. an inactive repressor [Option ID = 88637]

**Correct Answer :-**

- an inactive repressor [Option ID = 88637]

**15) Positive sense RNA virus genomes are not coated with proteins except in case of:**

**[Question ID = 52196]**

1. Retroviruses [Option ID = 88776]
2. Flaviviruses [Option ID = 88778]
3. Picornaviruses [Option ID = 88779]
4. Rotaviruses [Option ID = 88777]

**Correct Answer :-**

- Retroviruses [Option ID = 88776]

**16) Antibodies directed against which of the following components of LPS (present in the cell wall of gram-negative bacteria) determine the serotype of the bacteria?**

**[Question ID = 52170]**

1. O-specific side chain [Option ID = 88674]
2. Lipid A [Option ID = 88673]
3. Core oligosaccharide [Option ID = 88672]
4. Teichoic acid [Option ID = 88675]

**Correct Answer :-**

- O-specific side chain [Option ID = 88674]

**17) Antibiotic erythromycin disrupts protein synthesis by preventing translocation. Assuming you are performing in vitro translation and you add erythromycin after the formation of the 10th peptide bond but before the formation of the 11th peptide bond, which of the following statements would be correct?**

**[Question ID = 52176]**

1. tRNA in the P site would not be charged with any amino acid and eleven amino acids would be attached to the tRNA in the A site. [Option ID = 88697]
2. Eleven amino acids would be attached to the tRNA in the P site while the A site would be empty. [Option ID = 88699]
3. Ten amino acids would be attached to the tRNA in the P site and only one amino acid would be attached to tRNA in the A site. [Option ID = 88696]
4. Neither A site nor P site would carry any tRNA. [Option ID = 88698]

**Correct Answer :-**

- Ten amino acids would be attached to the tRNA in the P site and only one amino acid would be attached to tRNA in the A site. [Option ID = 88696]

**18) Lactose transport through *E. coli* membrane is an example of:**

**[Question ID = 52183]**

1. Secondary active transport [Option ID = 88725]
2. Primary active transport [Option ID = 88724]
3. Facilitative diffusion [Option ID = 88726]
4. Group translocation [Option ID = 88727]

**Correct Answer :-**

- Secondary active transport [Option ID = 88725]

**19) Supramolecular "injectisome" is produced during:**

**[Question ID = 52182]**

1. Phage mediated injection of DNA [Option ID = 88722]
2. All of these [Option ID = 88723]
3. Type III secretion system (TTSS / T3SS) of bacteria [Option ID = 88721]
4. Type V secretion system of bacteria [Option ID = 88720]

**Correct Answer :-**

- Type III secretion system (TTSS / T3SS) of bacteria [Option ID = 88721]

**20) *Clostridium difficile* commonly known as *C. diff* is known to be associated with:**

**[Question ID = 52195]**

1. MRSA [Option ID = 88774]
2. Antibiotic related diarrhea [Option ID = 88773]
3. Surgical site infections [Option ID = 88772]
4. TORCH group of pathogens [Option ID = 88775]

**Correct Answer :-**

- Antibiotic related diarrhea [Option ID = 88773]

**21) Eukaryotic myoglobin protein is composed of 150 amino acids. What would be the number of nucleotides in the open reading frame in the corresponding mRNA. [Question ID = 52167]**

1. 450 bases [Option ID = 88661]
2. 453 bases [Option ID = 88660]
3. 900 bases [Option ID = 88663]
4. 447 bases [Option ID = 88662]

**Correct Answer :-**

- 453 bases [Option ID = 88660]

**22) Four *trp* operon mutants were isolated. Mutant A carries a *trp* repressor which cannot bind the operator sequence even in the presence of tryptophan. Mutant B expresses a *trp* repressor protein that is unable to bind tryptophan. Mutant C carries a mutation in the ribosome binding site at the 5' end of the mRNA and a *trp* repressor that cannot bind to the operator even in the presence of tryptophan. Which mutant cannot be "rescued" by expressing wild type *trp* repressor in the cells?**

**[Question ID = 52181]**

1. Mutant B [Option ID = 88717]
2. Mutant C [Option ID = 88718]
3. Mutant A [Option ID = 88716]
4. None of these [Option ID = 88719]

**Correct Answer :-**

- Mutant C [Option ID = 88718]

**23)** Single molecule real time sequencing uses  $\phi$ 29 DNA polymerase because:

**[Question ID = 52187]**

1. It has high fidelity. [Option ID = 88741]
2. It has exceptionally high processivity. [Option ID = 88740]
3. All of these [Option ID = 88743]
4. It can incorporate phospho-linked nucleotides. [Option ID = 88742]

**Correct Answer :-**

- All of these [Option ID = 88743]

**24)** The rate of enzyme catalysed reaction was measured using several substrate concentrations that were much lower than  $K_m$ . The dependence of enzyme velocity can be best explained as:

**[Question ID = 52197]**

1. Proportional to substrate concentration [Option ID = 88781]
2. A constant fraction of  $V_{max}$  [Option ID = 88782]
3. Zero order with respect to substrate concentration [Option ID = 88783]
4. Independent of enzyme concentration [Option ID = 88780]

**Correct Answer :-**

- Proportional to substrate concentration [Option ID = 88781]

**25)** The following is the sum of three steps in the citric acid cycle:



A, B, C stands for:

**[Question ID = 52190]**

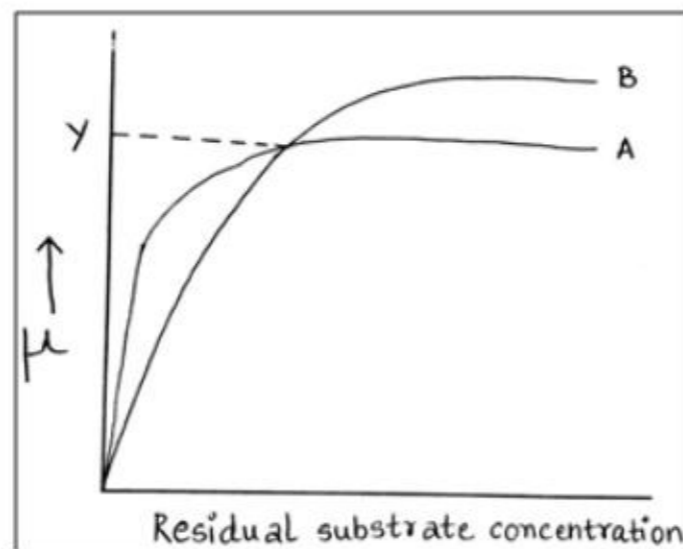
1.  $\alpha$  ketoglutarate,  $\text{NAD}^+$ , succinate [Option ID = 88754]
2. Succinate,  $\text{NAD}^+$ , malate [Option ID = 88755]
3. Succinate,  $\text{NAD}^+$ , oxaloacetate [Option ID = 88753]
4. Succinyl CoA, GDP, succinate [Option ID = 88752]

**Correct Answer :-**

- Succinate,  $\text{NAD}^+$ , oxaloacetate [Option ID = 88753]

**26)**

If A and B microorganisms are present in a continuous enrichment culture, limited by the substrate, then which organism will be selected above a specific growth rate of  $\mu$



[Question ID = 52209]

1. Both [Option ID = 88830]
2. Neither A nor B [Option ID = 88831]
3. Organism B [Option ID = 88829]
4. Organism A [Option ID = 88828]

**Correct Answer :-**

- Organism B [Option ID = 88829]

27) A protein sample of 2mg/ml concentration was provided to a class. Students were asked to calculate molar concentration of the sample if molecular weight of the protein is 50 kDa. The class came up with 4 different values. Choose the correct option

Value 1	Value 2	Value 3	Value 4
40 $\mu$ M	$4 \times 10^{-3}$ M	0.04 mM	$4 \times 10^{-5}$ M

[Question ID = 52199]

1. Values 1,3 and 4 [Option ID = 88790]
2. Only value 1 [Option ID = 88789]
3. Only value 4 [Option ID = 88791]
4. Both values 2 and 3 [Option ID = 88788]

**Correct Answer :-**

- Values 1,3 and 4 [Option ID = 88790]

28) You perform a BLAST search using the sequence of a new virus you have isolated. You get the following results. What can you determine from these results?

Score E Sequences producing significant alignments	Total Score
gi 28416271 gb AC121946.3  Yellow fever capsid protein	25
gi 68072784 ref XM_673214.1  Dengue fever virus 1 capsid protein	400
gi 70951865 ref XM_740047.1  Dengue fever virus 2 capsid protein	768
gi 23495940 gb AE014836.1  Dengue fever virus 3 capsid protein	954

[Question ID = 52193]

1. These results tell you nothing about how related your virus is to these viruses [Option ID = 88767]
2. Your new virus is equally related to dengue fever virus 1, 2, and 3 [Option ID = 88764]
3. Your new virus is most closely related to yellow fever virus [Option ID = 88766]
4. Your new virus is most closely related to dengue fever virus 3 [Option ID = 88765]

**Correct Answer :-**

- Your new virus is most closely related to dengue fever virus 3 [Option ID = 88765]

29)

Match the following:

Column A	Column B
I. ChIP	(i) Mutagenesis
II. BiFC	(ii) Protein-DNA interaction
III. Alpha-complementation	(iii) Global gene expression
IV. SAGE	(iv) Protein-protein interaction
	(v) Selection of recombinants

**[Question ID = 52188]**

1. I-(ii), II-(iii), III-(v), IV-(iv) [Option ID = 88744]
2. I-(ii), II-(iii), III-(v), IV-(iv) [Option ID = 88747]
3. I-(ii), II-(iv), III-(v), IV-(iii) [Option ID = 88746]
4. I-(iv), II-(ii), III-(i), IV-(iii) [Option ID = 88745]

**Correct Answer :-**

- I-(ii), II-(iv), III-(v), IV-(iii) [Option ID = 88746]

- 30) A student was asked to study the effect of  $\text{Ca}^{2+}$  ions on enzyme kinetics and thermal stability at  $50^\circ\text{C}$  (molecular weight of the enzyme is 30 kDa). The data was tabulated and plotted as given below and the results were interpreted as follows

Sample	$V_{max}$ ( $\mu\text{mol}/\text{mg}/\text{min}$ )	$K_m$ (mol/L)	$K_d$
In absence of Ca	40	0.50	-0.03
In presence of Ca	40	0.35	-0.01

- 1)  $K_{cat}$  is unaltered but catalytic efficiency is lowered in the presence of  $\text{Ca}^{2+}$
- 2)  $\text{Ca}^{2+}$  stabilizes the enzymes at  $50^\circ\text{C}$  and also increases the affinity of enzyme towards substrate
- 3) The enzyme has higher  $t_{1/2}$  in presence of  $\text{Ca}^{2+}$  at  $50^\circ\text{C}$  and its  $K_{cat}$  value is  $1.2 \times 10^3 \text{ min}^{-1}$
- 4) The enzyme has higher  $t_{1/2}$  in presence of  $\text{Ca}^{2+}$  at  $50^\circ\text{C}$  and its  $K_{cat}$  value is  $1.33 \text{ min}^{-1}$

Which of the following combination of statement(s) is correct?

**[Question ID = 52204]**

1. 2 and 4 [Option ID = 88810]
2. 2 and 3 [Option ID = 88809]
3. 1 and 4 [Option ID = 88811]
4. 1, 2 and 3 [Option ID = 88808]

**Correct Answer :-**

- 2 and 3 [Option ID = 88809]

31)

In a CSTR process, the dilution rate of the process was set at  $0.25 \text{ h}^{-1}$ , whereas the flow rate of fresh medium was set at  $800 \text{ ml/h}$ . Calculate the working volume of the process at a specific biomass yield of  $Y_{P/X}$  of 0.5.

**[Question ID = 52200]**

1. 800 ml [Option ID = 88792]
2. 3200 ml [Option ID = 88795]
3. 2400 ml [Option ID = 88794]
4. 1200 ml [Option ID = 88793]

**Correct Answer :-**

- 3200 ml [Option ID = 88795]

**32) V-D-J rearrangement is responsible for generating diversity of:**

**[Question ID = 52201]**

1. T cell receptors (TCR) only [Option ID = 88798]
2. Immunoglobulin variable region only [Option ID = 88796]
3. Immunoglobulin variable and constant region only [Option ID = 88797]
4. Both Immunoglobulin variable region and TCR [Option ID = 88799]

**Correct Answer :-**

- Both Immunoglobulin variable region and TCR [Option ID = 88799]

**33) When virulent viruses are repeatedly cultured for many passages in cell culture system, then:**

**[Question ID = 52185]**

1. Viruses evolve to grow efficiently in cell culture and may lose sequences associated with pathogenicity and get attenuated [Option ID = 88734]
2. Virulent viruses cannot be passaged in cell culture [Option ID = 88735]
3. Viruses become more virulent and pathogenic [Option ID = 88733]
4. Viruses lose their ability to grow in cell culture after few passages [Option ID = 88732]

**Correct Answer :-**

- Viruses evolve to grow efficiently in cell culture and may lose sequences associated with pathogenicity and get attenuated [Option ID = 88734]

**34) You have isolated an *E. coli* mutant which lyses faster than the wild type strain in hypotonic solution. A defect in which of the following proteins in the mutant strain would manifest such a result?**

**[Question ID = 52179]**

1. Porin protein [Option ID = 88708]
2. Aquaporin [Option ID = 88709]
3. ABC transporter [Option ID = 88711]
4. Mechanosensitive channel [Option ID = 88710]

**Correct Answer :-**

- Mechanosensitive channel [Option ID = 88710]

**35) Major histocompatibility class I (MHC-I) molecules are present on:**

**[Question ID = 52189]**

1. All nucleated cells [Option ID = 88750]
2. Antigen presenting cells (APCs) only [Option ID = 88749]
3. B lymphocytes but not on T lymphocytes [Option ID = 88751]
4. B lymphocytes only [Option ID = 88748]

**Correct Answer :-**

- All nucleated cells [Option ID = 88750]

**36) Towards deciphering the genetic code Dr. Har Gobind Khorana developed a method to synthesize long RNA molecules consisting of short defined sequence repeated many times. Assuming 5' UUAC sequence is repeated over and over, how many different triplets would occur in synthetic RNA?**

**[Question ID = 52178]**

1. UUA, CUU, ACU, UAC [Option ID = 88707]
2. UUA, CAU, UAC, ACU [Option ID = 88706]
3. CAU, AUU, UUC, UCA [Option ID = 88704]



4. CUU, ACU, CAU, UUU [Option ID = 88705]

**Correct Answer :-**

- UUA, CUU, ACU, UAC [Option ID = 88707]

**37) A sample of 0.2 ml of purified protein is diluted to a total volume of 1.0 ml in a cuvette having a 1 cm light path. The absorbance of the sample at 280 nm was 0.50. What is the protein concentration in the original sample? Consider 1 absorbance unit at 280 nm equal to 1 mg protein/ml.**

**[Question ID = 52165]**

1. 1.50 mg/ml [Option ID = 88655]
2. 1.0 mg/ml [Option ID = 88652]
3. 2.50 mg/ml [Option ID = 88654]
4. 1.25 mg/ml [Option ID = 88653]

**Correct Answer :-**

- 2.50 mg/ml [Option ID = 88654]

**38) In a sterilization process, the overall Del factor of the process was 48.2, whereas heating Del factor and cooling Del factors were 22.5 and 14.3 respectively. Calculate the holding Del factor of the process.**

**[Question ID = 52172]**

1. 85.0 [Option ID = 88683]
2. 48.2 [Option ID = 88682]
3. 11.4 [Option ID = 88680]
4. 36.8 [Option ID = 88681]

**Correct Answer :-**

- 11.4 [Option ID = 88680]

**39) In an experiment, vero cells are required to be infected with PPR virus. If one million cells are grown in a 100 mm cell culture dish and infected with virus at multiplicity of infection (moi) of 10, then what percentage of cells will get infected?**

**[Question ID = 52168]**

1. 63% [Option ID = 88665]
2. 100% [Option ID = 88664]
3. 36% [Option ID = 88666]
4. 10% [Option ID = 88667]

**Correct Answer :-**

- 63% [Option ID = 88665]

**40) Which of following statements is incorrect about the enzyme complex which synthesizes ATP during oxidative phosphorylation?**

**[Question ID = 52203]**

1. Its activity is not affected by un-coupler [Option ID = 88807]
2. It binds to molecular oxygen [Option ID = 88806]
3. It is inhibited by oligomycin [Option ID = 88804]
4. It contains a protein channel [Option ID = 88805]

**Correct Answer :-**

- It binds to molecular oxygen [Option ID = 88806]

**41) Which of the following is NOT involved in regulating the synthesis of RNA in the eukaryotic nucleus?**

**[Question ID = 52208]**

1. Spliceosomes that stimulate synthesis of intron-containing hnRNAs [Option ID = 88826]
2. Enhancers that can stimulate specific promoters [Option ID = 88827]
3. Use of different RNA polymerases to transcribe different classes of RNA [Option ID = 88825]
4. Active genes in euchromatin, and inactive genes in heterochromatin [Option ID = 88824]

**Correct Answer :-**

- Spliceosomes that stimulate synthesis of intron-containing hnRNAs [Option ID = 88826]

42) Which of the following describes the expected products when the polypeptide lys-phe-gly-arg-met-lys-tyr is treated as indicated below?

[Question ID = 52207]

1. Treatment with cyanogen bromide yields two fragments [Option ID = 88822]
2. Treatment with urea gives rise to more than three fragments [Option ID = 88821]
3. Treatment with phenyl isothiocyanate yields one product [Option ID = 88823]
4. Treatment with chymotrypsin yields three products [Option ID = 88820]

Correct Answer :-

- Treatment with cyanogen bromide yields two fragments [Option ID = 88822]

43) Which of the following subset of T cells have been implicated to play a role as suppressor T cells?

[Question ID = 52214]

1. NK cells [Option ID = 88850]
2. iNKT [Option ID = 88849]
3. CD<sub>4</sub><sup>+</sup> CD<sub>25</sub><sup>+</sup> FoxP3<sup>+</sup> T cells [Option ID = 88851]
4.  $\gamma/\delta$  T cell [Option ID = 88848]

Correct Answer :-

- CD<sub>4</sub><sup>+</sup> CD<sub>25</sub><sup>+</sup> FoxP3<sup>+</sup> T cells [Option ID = 88851]

44) Which of the following is a common test for microorganisms to check the sterility of a fermenter during sterilization process?

[Question ID = 52194]

1. *Bacillus licheniformis* [Option ID = 88769]
2. *Bacillus stearothermophilus* [Option ID = 88771]
3. *Bacillus halodurans* [Option ID = 88768]
4. *Bacillus subtilis* [Option ID = 88770]

Correct Answer :-

- *Bacillus stearothermophilus* [Option ID = 88771]

45) Which of the following is a facultative intracellular pathogen?

[Question ID = 52180]

1. Prions [Option ID = 88715]
2. Hepatitis C virus [Option ID = 88714]
3. *Mycobacterium tuberculosis* [Option ID = 88713]
4. *Staphylococcus aureus* [Option ID = 88712]

Correct Answer :-

- *Mycobacterium tuberculosis* [Option ID = 88713]

46) Which of the following statements regarding termination of transcription in prokaryotes is correct?

[Question ID = 52164]

1. Rho factor has topoisomerase activity for relieving supercoiling [Option ID = 88649]
2. Termination often involves a stem-loop structure forming in the DNA template [Option ID = 88651]
3. Termination often involves a stem-loop structure forming in the RNA transcript [Option ID = 88650]
4. In Rho dependent termination the Rho factor moves along the DNA template ahead of the RNA polymerase [Option ID = 88648]

Correct Answer :-

- Termination often involves a stem-loop structure forming in the RNA transcript [Option ID = 88650]

47) Which of the following terms best describe the oral polio vaccine (OPV) program being undertaken in our country?

**[Question ID = 52173]**

1. Cell-mediated immunity [Option ID = 88687]
2. Passive immunization [Option ID = 88684]
3. Both active and passive immunization [Option ID = 88686]
4. Active immunization [Option ID = 88685]

**Correct Answer :-**

- Active immunization [Option ID = 88685]

**48) Which of the following compounds cannot give rise to net synthesis of glucose?**

**[Question ID = 52192]**

1. Acetyl CoA [Option ID = 88761]
2. Lactate [Option ID = 88760]
3. Pyruvate [Option ID = 88762]
4. Glycerol [Option ID = 88763]

**Correct Answer :-**

- Acetyl CoA [Option ID = 88761]

**49) Which of the following is currently the most preferred tool for studying global epidemiology of bacterial pathogens?**

**[Question ID = 52184]**

1. Pulsed Field Gel Electrophoresis (PFGE) [Option ID = 88731]
2. Multilocus Sequence Typing (MLST) [Option ID = 88730]
3. Multilocus Enzyme Electrophoresis (MLEE) [Option ID = 88729]
4. Multilocus Variable Number Tandem Repeats (MLVA) [Option ID = 88728]

**Correct Answer :-**

- Multilocus Sequence Typing (MLST) [Option ID = 88730]

**50) Which of the following influences the oxygen availability in a fermentation process?**

**[Question ID = 52171]**

1. All of these [Option ID = 88679]
2. Antifoam [Option ID = 88677]
3. Medium Rheology [Option ID = 88676]
4. Agitation rate [Option ID = 88678]

**Correct Answer :-**

- All of these [Option ID = 88679]