

JPSC Asst Director, Sr Scientific Officer Questions & Answers



1) When a beam of white rays is dispersed by a prism which colour will be refracted to a larger extent?

Answer: Violet.

2) The modern atomic mass unit is based on _____

Answer: Carbon-12.

3) What do you mean by the photoelectric effect?

Answer: Emission of electrons by electromagnetic radiation striking on a metal surface.

4) A raincoat is made of what?

Answer: Polychloroethene.

5) What is the value of Planck's constant in SI units?

Answer: 6.625×10^{-34} Js.

6) The total number of electrons present in 18 ml of water is _____

Answer: 6.02×10^{24} .

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7) What is the velocity of light in m/s?

Answer: 3×10^8 m/s.

8) Which element on adding to natural rubber makes it less sticky in hot weather and less hard in cold weather?

Answer: Sulfur.

9) The scientist who introduced the model of the atom similar to the solar system?

Answer: Ernest Rutherford.

10) 3 g of salt of molecular weight 30 is dissolved in 250 g of water. The molality of the solution is _____

Answer: 0.4m.

11) Define What Is An Oviparous Animal?

Answer: Oviparous animal is an egg laying animal.

12) Which Is The Most Successful And Evolving Mammal Of The Animal Kingdom?

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Answer: Mouse.

13) Which Is The Ugliest Of All Mammals?

Answer: Warthog.

14) Explain How Do Mammals Communicate?

Answer: They communicate by sounds, touch, visual clues and odour.

15) Which Is The Smallest Mammal?

Answer: The pygmy whitetoothed shrew.

16) Define What Is The Difference Between A Hare And A Rabbit?

Answer: Hares have longer hind legs and longer ears than rabbits.

17) Which Birds Lives, Breeds, Sleeps And Eats Underground?

Answer: The mole.

18) Which Is The Mammal That Can Differentiate Between Different Colours?

Answer: Except man, the ape is the only mammal which can differentiate between different colours.

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19) Define What Is The Meaning Of The Term 'lagomorpha'?

Answer: Rabbits, hares and Pikas are grouped together and called "Lagomorpha".

20) Which Is The Mammal That Has Wings For Flying?

Answer: Bat.

21. Hfr strains of bacteria:

- A. do not have an "F" (fertility) factor.
- B. have an "F" factor plasmid.
- C. have an "F" factor integrated in the bacterial chromosome.
- D. transfer the genetic information to other bacteria with high frequency

22. Match the following terms (1-6) with their respective meanings (A-F).

- 1. fermentation A. carbon from organic compounds
- 2. respiration B. carbon from CO₂
- 3. autotroph C. oxidative phosphorylation
- 4. lithotroph D. substrate-level phosphorylation
- 5. heterotroph E. energy from oxidation of inorganic compounds
- 6. phototroph F. energy from light

The proper combination is:

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- A. 1A-2B-3E-4F-5C-6D C. 1D-2C-3B-4E-5A-6F
B. 1D-2C-3A-4B-5E-6F D. 1C-2A-3B-4E-5F-6D

23. What chemicals are responsible for the flavor and holes in Swiss cheese?

- A. lactate, oxygen
- B. propionic acid, carbon dioxide
- C. acetic acid, carbon dioxide
- D. ethanol, hydrogen
- E. butyric acid, hydrogen

24. Which of the following are not examples of a terminal electron acceptor in anaerobic respiration?

- A. nitrate
- B. hydrogen sulfide
- C. iron hydroxide
- D. H₂
- E. sulfate

25. Which photosynthetic pigments are found in all prokaryotic and eukaryotic photoautotrophs?

- A. chlorophyll c
- B. carotenoids
- C. phycobilins
- D. phycocyanin



E. chlorophyll a

26. The site of ATP synthesis in microorganisms includes:

- A. cytoplasmic membranes
- B. cell walls
- C. chloroplasts
- D. mitochondria

27. NAD and FAD are hydrogen carriers, but cytochromes are electron carriers in bacteria. What happens to the protons (H^+) in electron transport chains?

- A. They go into solution inside the cytoplasm.
- B. They are taken back by NAD and FAD.
- C. They are carried from cytochromes to oxygen to form water.
- D. They go into solution outside the cytoplasmic membrane.

28. The Calvin cycle:

- A. is a C3 pathway
- B. is used by all photoautotrophic microorganisms
- C. is a C4 pathway
- D. is a dark reaction
- E. occurs in the thylakoid space in chloroplasts

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29. The oxidation-reduction pairs X/XH₂ and Y/YH₂ have reduction potentials of -50 and +75 millivolts, respectively. This means that electrons would most likely be removed from _____ to reduce _____.

- A. XH₂, X
- B. Y, XH₂
- C. YH₂, X
- D. Y, YH₂
- E. XH₂, Y

30. Identify the correct statement(s). In eukaryotic microorganisms:

- A. mRNA is long-lived (hours to days).
- B. a single, circular chromosome is present.
- C. 5s, 16s, and 23s ribosomal RNAs are present.
- D. extrachromosomal DNA can be present.
- E. the initiation sequence in mRNA codes for N-formylmethionine.

31. Which of the following is not an RNA base?

- Adenine
- Uracil
- Thymine**
- Cytosine



32. The strand on which DNA replication is continuous is called the:

Leading strand

Lagging strand

Major strand

Minor strand

33. Which of the following is not characteristic of prokaryotic terminators?

Rho-independent terminators

Rho-dependent terminators

The TATA box

Hairpin loops

34. What is the sequence recognized by poly (A) polymerase?

TATAAA

CAA

CCCGAA

AAUAAA

35. What is the name of a mutation that changes the reading frame of an RNA molecule?

Frameshift mutation

Missense mutation

Nonsense mutation



Change-frame mutation

36. The 3' end of a tRNA molecule contains which of the following sequences?

TATA

CAA

AUG

UAA

37. What is the name of the bond that links the nitrogen base and the ribose sugar in a nucleotide?

Phosphodiester bond

5'-5' bond

Glycosidic bond

Amide bond

38. What is the enzyme responsible for stitching together Okazaki fragments?

Helicase

Single-stranded binding protein

Primase

Ligase



39. Which of the following sequences is not typical of a eukaryotic polymerase II promoter?

TATAAAA

TTGACA

GCCCAATCT

GGGCG

40. How many base pairs make up a codon?

1

2

3

4