



HINDUSTAN
INSTITUTE OF TECHNOLOGY & SCIENCE
(DEEMED TO BE UNIVERSITY)

HINDUSTAN INSTITUTE OF TECHNOLOGY AND SCIENCE,
PADUR

HITSEEE 2021

SAMPLE QUESTIONS

Total Questions: 60

Duration: 60 Minutes

MATHS

1. Two dice are thrown at the same time. Find the probability of getting different values on both.
- a. $\frac{5}{6}$ b.
 - $\frac{1}{2}$ c.
 - $\frac{1}{6}$ d.
 - $\frac{1}{36}$

ANSWER: C

2. If matrices A and B are inverse of each other then
- a. $AB=BA$
 - b. $AB=BA=I$
 - c. $AB=BA=0$
 - d. $AB=0, BA=I$

ANSWER: B

3. The point diametrically opposite to the point P (1, 0) on the circle $x^2 + y^2 + 2x + 4y - 3 = 0$ is
- a. (-3, -4)
 - b. (-3, 4)
 - c. (3, 4)
 - d. (-4, -1)

ANSWER: A

4. The conjugate of a complex number is $\frac{1}{i-1}$. Then the complex number is
- a. $-\frac{1}{i-1}$
 - b. $\frac{1}{i+1}$
 - c. $\frac{1}{i-1}$ d.
 - $-\frac{1}{i+1}$

ANSWER: B

5. What is the probability that the minute and hour hands of a clock will form an acute angle at any given time?

- a. $P > 0.5$ b.
- $P = 0.5$ c.
- $P < 0.5$ d.
- $P = 0.25$

ANSWER: C

6. A single die is rolled. The probability of getting 1 or an even number is

- a. $1/6$
- b. $4/6$
- c. $5/6$
- d. $3/6$

ANSWER: D

7. The perpendicular bisector of the line segment joining P (1, 4) and Q (k, 3) has y-intercept - 4. Then a possible value of k is

- a. 1
- b. -
- c. 4
- d. 3

ANSWER: B

8. The mean of the numbers a, b, 8, 5, 10 is 6 and the variance is 6.80. Then which one of the following gives possible values of a and b?

- a. $a=0, b=7$
- b. $a=5, b=2$
- c. $a=3, b=4$
- d. $a=2, b=4$

ANSWER: C

9. The line passing through the points (5, 1, a) and (3, b, 1) crosses the yz-plane at the point (0, $17/2$, $-13/2$) Then

- a. $a=2, b=8$
- b. $a=4, b=6$
- c. $a=6, b=4$
- d. $a=8, b=2$

ANSWER: C

10. The first two terms of a geometric progression add up to 12. The sum of the third and the fourth terms is 48. If the terms of the geometric progression are alternately positive and negative, then the first term is

- a. -
- b. 2
- c. -12
- d. 8

ANSWER: C

11. How many real solutions does the equation $x^7 + 14x^5 + 16x^3 + 30x - 560 = 0$ have?

- a. 1
- b. 4
- c. 7
- d. 5

ANSWER: A

12. A single die is rolled. The probability of getting 1 or an even number is

- a. $\frac{1}{6}$
- b. $\frac{4}{6}$
- c. $\frac{5}{6}$
- d. $\frac{3}{6}$

ANSWER: D

13. Each of letters of the word PILOTS is on separate cards, face down on the table. If you pick a card at random, what is the probability that the letter will be a T or an L?

- a. $\frac{1}{6}$
- b. $\frac{1}{3}$
- c. $\frac{1}{2}$
- d. $\frac{2}{3}$

ANSWER: D

14. If the system of linear equations

$$x + 2ay + az = 0$$

$$x + 3by + bz = 0$$

$$x + 4cy + cz = 0$$

has a non-zero solution, then a, b, c

- a. are in A.P. b. are in G.P.
- c. are in H.P. d. satisfy $a + 2b + 3c = 0$

ANSWER: C

15. A student is to answer 10 out of 13 questions in an examination such that he must choose at least 4 from the first five questions. The number of choices available to him is

- a. 140
- b. 196
- c. 280
- d. 346

ANSWER: B

CHEMISTRY

1. The wave associated with a particle is called
- A. ElectromagneticWave
 - B. MatterWave
 - C. MicroWave
 - D. AlltheAbove

ANSWER: B

2. De-Broglie concept is significant for
- A. Electrons
 - B. Protons
 - C. Neutrons
 - D. Alltheabove

ANSWER: D

3. The nodal plane for 2px orbitalis
- A. XYplane
 - B. YZplane
 - C. XZplane
 - D.Alltheabove

ANSWER: B

4. The molecule with greater bond dissociation energy is
- A.H₂
 - B. Li₂
 - C.O₂
 - D.N₂

ANSWER: D

5. Whichofthefollowingwillhavelowestboilingpoint?
- A. o-nitrophenol
 - B. m-nitrophenol
 - C. p-nitrophenol
 - D.All the above

ANSWER: A

6. The number of nodes in s-orbitalofanyenergylevelisequal to
- A. $2n+1$
 - B. $n+1$
 - C. $2n-1$

D. $n-1$
ANSWER: D

7. The hybridization in ICl_4 is
- A. sp^3d
 - B. sp^3d^3
 - C. sp^3
 - D. sp^3d^2

ANSWER: D

8. Pauling's method of calculation of ionic radii is not applicable for
- A. NaF
 - B. KCl
 - C. CsCl
 - D. RbBr

ANSWER: C

9. The contribution of other electrons present in 1s orbital to 'S' value is
- A. 0
 - B. 0.35
 - C. 0.85
 - D. 0.30

ANSWER: D

10. The metal with comparatively high electron affinity is
- A. Chlorine
 - B. Cesium
 - C. Gold
 - D. Cadmium

ANSWER: C

11. Inert pair effect is a characteristic feature of-----elements
- A. s-block
 - B. p-block
 - C. d-block
 - D. f-block

ANSWER: B

12. The oxyacid of phosphorus which is a powerful reducing agent (reduces AgNO_3) is
- A. H_3PO_3
 - B. H_3PO_4
 - C. $\text{H}_4\text{P}_2\text{O}_7$
 - D. PH_3

ANSWER: A

13. The compound with rotten fish odour is

- A. P_2O_3
- B. H_3PO_3
- C. PH_3
- D. P_2O_5

ANSWER: C

14. Which of the following is not possible?

- A. I_3^-
- B. F_3
- C. Br_3^-
- D. Cl_3^-

ANSWER: B

15. Which of the following inert gas is not found in air?

- A. Helium
- B. Neon
- C. Krypton
- D. Radon

ANSWER: D

PHYSICS

1. Which of the following is an electromagnetic spectrum?

- A. Gamma rays
- B. X-rays
- C. Visible rays
- D. All of the above

ANSWER: D

2. Two balls at the same temperature collide. What is conserved?

- A. Momentum
- B. Kinetic energy
- C. Velocity
- D. Temperature

ANSWER: A

3. When light travels from air to water, which parameter does not change?

- A. Wavelength
- B. Frequency
- C. Velocity
- D. All of these

ANSWER: B

4. Exothermic processes:
- A. Absorb energy
 - B. Have no energy change
 - C. Are impossible to predict the energy change
 - D. Give off energy.

ANSWER: D

5. A force is completely defined if we specify
- A. Magnitude and direction
 - B. Magnitude and point of application.
 - C. Direction and point of application
 - D. Magnitude, direction and point of application

ANSWER: D

6. On dipping an electrically conducting rod in boiling water, its conductivity
- A. Increases
 - B. Decreases
 - C. Remains unchanged
 - D. Decreases for thin rod but increases for thick rod

ANSWER: B

7. According to the triangle law of forces,
- A. Three forces acting at a point will be in equilibrium
 - B. Three forces acting at a point can be represented in magnitude by the faces of a triangle taken in order then the three forces are in equilibrium
 - C. Three forces acting at a point can be represented in magnitude and direction by the faces of a triangle taken in order then the three forces are in equilibrium
 - D. None of these

ANSWER: C

8. If Young's interference experiment is performed using two separate identical sources of light instead of using two slits and one bulb, then
- A. Interference fringes will be brighter
 - B. Interference fringes will be coloured
 - C. Interference fringes will be darker
 - D. No fringes will be obtained

ANSWER: D

9. A needle floats on the surface of the water because of
- A. Lightweight
 - B. Adhesive force
 - C. Viscosity
 - D. Surface tension

ANSWER: D

10. The sky looks blue because the sun light is subjected to

- A. Compton scattering
- B. Rayleigh scattering
- C. Both of the above
- D. None of the above

ANSWER: B

11. A particle is taken around a circle by the application of force. Then, the work done

- A. By the force is zero
- B. By the force is +ve non zero
- C. By the particle is +ve non zero
- D. On the particle is +ve non zero

ANSWER: A

12. A satellite revolves around the earth in an elliptical orbit. Its speed:

- A. Is the same at all points in the orbit
- B. Is greatest when it is closest to the earth
- C. Is greatest when it is farthest from the earth
- D. Goes on increasing or decreasing continuously depending upon the mass of the satellite

ANSWER: B

13. How many millimetres are in 24 cm?

- A. 240
- B. 2400
- C. 24,000
- D. 240,000

ANSWER: A

14. The drift velocity of free electrons in a conductor is 'v' when a current 'i' is flowing in it. If both the radius and current are doubled, then drift velocity will be

- A. V
- B. $V/2$
- C. $V/4$
- D. $V/8$

ANSWER: B

15. The amount of material found in an object is known as its

- A. Density
- B. Mass
- C. Volume
- D. Temperature

ANSWER: B

GENERAL KNOWLEDGE

1. On which animal/bird did Thailand announce to test Coronavirus vaccine?

- A. Monkeys
- B. Lizards
- C. Hens
- D. Kites

ANSWER: A

2. In a study, which cells are found in COVID-19 patients 'bode well' for long term immunity?

- A. P-cell
- B. D-Cell
- C. T-Cell
- D. Endothelial Cells

ANSWER: C

3. Which type of drugs are Hydroxychloroquine and Chloroquine?

- A. Anti-Viral
- B. Anti-Malarial
- C. Anti-Bacterial
- D. Anti-Fungal

ANSWER: B

4. What is Coronavirus?

- A. It is a large family of viruses
- B. It belongs to the family of Nidovirus
- C. Both A & B
- D. It is originated from insects

ANSWER: C

5. Which of the following diseases are related to coronavirus?

- A. MERS
- B. SARS
- C. Both A and B
- D. Neither A nor B

ANSWER: C

6. Which country has conferred Manipuri doctor, Thangjam Dhabali Singh with "Order of Rising Sun Gold and Silver Rays"?

- A. Indonesia
- B. South Korea
- C. Japan

D. China
ANSWER: C

7. Name the Indian state which topped the list of providing maximum employment under Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) as per data of Rural development ministry.

- A. Chhattisgarh
- B. Rajasthan
- C. Uttar Pradesh
- D. West Bengal

ANSWER: A

8. Global Day of Parents is celebrated on _____.

- A. July 28
- B. August 04
- C. June 01
- D. April 13

ANSWER: C

9. MyLife MyYoga was launched by _____.

- A. PM Modi
- B. Nirmala Sitharaman
- C. CM Bode
- D. Amrisha Pandey

ANSWER: A

10. Which company has become the first private rocket company to send astronauts to space?

- A. SpaceX
- B. Blue Origin
- C. Tesla
- D. The Boring Company

ANSWER: A

11. Who is the only Indian in the Forbes' list of world's highest-paid athletes?

- A. Rohit Sharma
- B. P.V. Sindhu
- C. Virat Kohli
- D. Hima Das

ANSWER: C

12. Which state has become the first state to complete the migration of workers to their home state through Shramik Special trains?

- A. Madhya Pradesh
- B. Gujarat

C. AndhraPradesh
D. TamilNadu
ANSWER: B

13. Who has been appointed as Food Safety Regulator Chief?
A. RahulBothan
B. PratheepSingh
C. ArunSinghal
D. HasiniShangal

ANSWER: C

14. Bobby Joe Morrow who passed away at 84 is associated with_____.
A. Politics
B. Science
C. Agriculture
D. Sports

ANSWER: D

15. “Ultra Swachh” Booth was developed by _____.
A. DRDO
B. ICMR
C. NLC
D. Noneofthese

ANSWER: A