

SPARDHA 2017-18

001

ALMA FIESTA 2018

6-8

Indian Institute of Technology, Bhubaneswar

NAME:

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CLASS:

Contact Info:

SCHOOL NAME:

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Email - ID (if available):

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INSTRUCTIONS

- Write your name, class and school name in the space provided above.
- Test will be of **1 hour**.
- Use only **black ball-point pen** to choose answers.
- **Darken** the circle in the OMR to select your answer. Do NOT circle, highlight, tick, etc. Answers chosen with anything else will not be considered for mark evaluation.
- **4 marks will be awarded** for a correct answer and **1 will be deducted** for an incorrect answer.
- No marks will be awarded for questions left unanswered.
- Rough work should **strictly** be done on the last page provided. Marks will be deducted for scribbling rough work on papers with questions on it.
- Calculators and other electronic gadgets are **strictly not allowed** inside the examination hall. If found with any such device, the candidate will be **immediately disqualified**.
- Candidates are advised to bring pencil, eraser, pen and school ID card (if available).

ALL THE BEST

MATHEMATICS

1. In a triangle ABC, $3A=4B=6C$. The value of A is:
(A) 60° (B) 80° (C) 20° (D) 100°
2. ABCD is a parallelogram in which diagonal AC and BD intersect at point O. If $\angle BAO=20^\circ$, $\angle COD=133^\circ$, then the value of $\angle ODC$ is:
(A) 25° (B) 22° (C) 35° (D) 27°
3. Three years ago, Johnson borrowed Rs.20,000 from a bank at the rate of 15% per annum. At the end of the year he paid Rs.7500 which included the interest for that year and some part of the loan. Similarly, he paid Rs.7500 at the end of the second year. If Johnson now wants to completely clear his loan, how much will he have to pay?
(A) Rs.12575.25 (B) Rs.11874.75 (C) Rs.15496.25 (D) None of These
4. Sum of three consecutive multiples of 7 is 357, find the smallest of the multiples involved.
(A)112 (B)126 (C)119 (D)116
5. Let $\sqrt{2+\sqrt{2+\sqrt{2+\dots}}} = x$, then x satisfies-
(A) $(x^2-x)/2=1$ (B) $(x^2+x)/2=1$ (C) $(x^2-x)/2=-1$ (D) $(x^2+x)/2=-1$
6. A motorboat goes downstream in river and covers the distance between two coastal towns in 5 hours. It covers this distance upstream in 6 hours. If speed of the stream is 3km/hr, find the speed of the boat in still water.
(A)33 (B)44 (C)25 (D)10
7. Kaushal rolls a wheel along a straight line. The wheel covers distance of 19.8 m and makes 21 rotations. Find the radius of the wheel (in cm).
(A)9 (B)11 (C)12 (D)
8. If the length of a rectangle is increased by 10% and the area is unchanged, then the corresponding breadth must be decreased by:
(A) $9^{1/11}\%$
(B) 10%
(C) 11%
(D) $11^{1/9}\%$
9. If an angle is its own complementary angle, then its measure is _____
(A) 30° (B) 45° (C) 60° (D) 90°
10. Two poles of height 9 m and 14 m, stand upright on a plane ground. If the distance between their feet is 12 m, the distance between their tops is:
(A) 15 (B) 14 (C) 13 (D) 12
11. A number whose factors (other than the no. itself) add up to the same no. is called as a perfect number. Which of these is/are perfect no.(s).
(A) 2 (B) 5 (C) 6 (D). 9

12. Rama sells a fridge for Rs.15000 at a loss of 20%. At what rate should she have sold the fridge to gain 20%?

- (A)18600 (B)14960 (C)22500 (D)21000

13. Two adjacent sides of a parallelogram are 10 cm and 15 cm. The altitude corresponding to the side 15 cm is 9 cm. Find the altitude corresponding to the side 10 cm.

- (A) 9 cm (B) 12 cm (C) 13.5 cm (D) 9.5 cm

14. Square root of 0.036 is

- (A)0.6 (B)0.06 (C) 0.036 (D)0.1897

15. The median of data 21, 33, 15, 19, 26, 32, 14 and 24 is:

- (A) 20.5 (B) 22.5 (C) 21.5 (D) 23.

16. Ashrey wants to cover floor of a room 5m wide and 7m long by square tiles of side 0.7m. How many tiles will he approximately need?

- (A) 70 (B) 71 (C) 72 (D) 73

PHYSICS

17. After what time will a person running with a constant speed of 20m/s (in the same direction) cover a distance 100m?

- (A) 2 sec (B)3 sec (C)4 sec (D)5sec

18. What is the S.I. Unit of pressure?

- (A) Pascal (B) Newton (C)m/s (D)N/m

19. Which of the following is 'NOT' a periodic motion?

- (A) A swinging pendulum (B) Hands of clock (C) Rotation of earth (D) A flying kite

20. Anjali placed a metre stick in the playground at 8.00 a.m. in the morning. How will the shadow of the stick at 1:00 pm be in comparison to the one at 8:00 am?

- (A) There will be no shadow
(B) The shadow will be longer and on the opposite side of the sun.
(C) The shadow will be shorter and on the same side as the sun.
(D) The shadow will be shorter and on the opposite side of the sun.

21. Two balls of masses m_1 and m_2 are thrown vertically upward with the same speed u . If air resistance is neglected, they will pass through their point of projection in the downward direction with a speed:

- (A) m_1u/m_2 (B) m_2u/m_1 (C) $(m_1+m_2)u/(m_1-m_2)$ (D) u

22. A pendulum oscillates 40 times in 4 sec. Find its frequency.

- (A) 40 Hz (B) 10 Hz (C) 4 Hz (D) 1 Hz

23. Hydraulic lifts work based on:

(A) Archimedes principle (B) Bernoulli's theorem (C) Pascal's law (D) Newton's law

24. An athlete completes one round of a circular track of radius R in 40 second. What will be his displacement at the end of 2 minute 20 second?

(A) Zero (B) 2R (C) $2\pi R$ (D) $7\pi R$

25. Lightyear is a unit of

(A) Time (B) Distance (C) Speed (D) All of the above

26. A body immersed in a fluid experiences an upward thrust which depends on: (i)the weight of fluid displaced by it, (ii)the volume of body, (iii)the mass of the body. Which of the following are true?

(A) (i) and (ii) (B) (i), ii, iii (C) Only (i) (D) (i) and (iii)

27. Which of the following is a bad conductor of heat:

(A) Silver (B) Aluminium (C) Iron (D) None of these

28. A train covers half of its journey with a speed of 20 m/sec, and the other half with a speed of 30 m/sec. The average speed of the train during the whole journey is

(A) 24 m/sec (B) 25 m/sec (C) 26 m/sec (D) 27 m/sec

CHEMISTRY

29. A change in which heat energy is absorbed is called:

(A) Periodic change (B) Undesirable change (C) Endothermic change (D) Exothermic change

30. What is the fuel used by the sun?

(A) Hydrogen (B) Helium (C) Hydrogen and Helium (D) Sodium

31. The principle used in squeezing out water from wet clothes is:

(A) Filtration (B) Chromatography (C) Decantation (D) Centrifugation

32. Most of the food items that we eat turns pH paper reddish in colour, but there are few exceptions. Which of the following will turn pH paper bluish green (slightly basic)?

(A) Sweet potatoes (B) Raisins (C) Tea (D) Honey

33. Sam took a piece of paper blotted with solution X. He dipped it in potassium hydroxide solution and the paper turned yellow. What do you think X is :

(A) Methyl orange (B) Phenolphthalein (C) Litmus paper (D) Phenol red

34. "Nitrogen fixation" means:

- (A) Conversion of atmospheric nitrogen into nitrogen compounds
(B) Nitrogen cycle in nature (C) Manufacture of nitrogen from air
(D) Liquification of nitrogen

35. Which of the following processes do not show neutralization?

- (i) Intake of milk of magnesia during indigestion
(ii) Rubbing calamine solution on skin to get relief from ant bite
(iii) Addition of turmeric in soap solution
(iv) Dissolving lime in water.

- (A) Both (i) & (ii) (B) Both (ii) & (iv) (C) Both (iii) & (iv) (D) Both (i) & (iv)

36. Crystallisation technique is better than simple evaporation technique as _____.

- (A) Some solids are evaporated with solvent
(B) Some solids decompose or some may get charred on heating to dryness
(C) Some impurities may remain dissolved in the solution even after filtration, which on evaporation contaminate the solid
(D) Both (b) and (c)

37. Which of the following are chemical changes?

- (i) Breaking down of ozone into oxygen
(ii) Heating of hacksaw blade to red hot stage
(iii) Acid rain
(iv) Beating aluminium to make aluminium foil

- (A) (i), (ii) and (iii) (B) (i) and (iii) (C) (ii) and (iv) (D) (ii), (iii) and (iv)

38. Glass is a good material to use as a container for some chemicals. Which of these is a chemical property of glass that makes it well-suited for this use?

- (A) It is inert and unlikely to react.
(B) It is brittle and easy to shatter.
(C) It is solid and unlikely to melt.
(D) It is clear and easy to see through.

39. Which one of the following is a metal?

- (A) Boron (B) Iodine (C) Carbon (D) Mercury

40. How many terminals does an electrical cell have?

- (A) Zero (B) Two (C) Four (D) Six

General Awareness

41. You see an electric board catch fire because of short-circuit. What should you do?

- (A) Disconnect the main supply
- (B) Pour water on the fire
- (C) Try to call your mom for help
- (D) Throw dirt on the fire

42. You see a “Drive slow” sign in front of you, which of the following buildings might be nearby?

- (A) Music club
- (B) Theatre Hall
- (C) School
- (D) Shopping Mall

43. You see a small red human being on a sign board telling you to stop, then what kind of road sign is it?

- (A) Zebra crossing
- (B) Pelican crossing
- (C) Can be either
- (D) A 6-way crossing

44. Suppose, you all were playing in the ground when your friend got hit in the nose and started bleeding. Which of the following should you do?

- (A) Run away crying
- (B) Let the blood drain away and stop naturally
- (C) Tell him to try and sneeze so that the pain reduces
- (D) Tilt his head back and pinch his nose to try and stop the bleeding

45. Suppose, a plastic ball is floating with half of its volume submerged in water and then it is moved to Mercury. Which of the following is most likely?

- (A) It will sink
- (B) It will float with lesser volume submerged
- (C) It will melt
- (D) It will float with greater volume submerged

46. A snake has bitten your friend. What should you do while taking him/her to hospital?

- (A) Try to suck the venom out
- (B) Wash the wound with soap
- (C) Apply antiseptic and cover it with bandage
- (D) None of this

47. You are on an absolutely frictionless surface (suppose on top of an ice block). How will you move?

- (A) Take really big steps
- (B) Try to jump
- (C) Try to sneeze
- (D) None of these

48. You are deserted in an island, just like Bear Grylls. What should be your most important concern?

- (A) Lighting a fire
- (B) Finding fresh water
- (C) Hunting for food
- (D) Creating a shelter

49. Among the following, what is the thing that could've killed you ages ago and can kill you today too?

- (A) Bubonic plague
- (B) Mosquitoes
- (C) Cholera
- (D) Dehydration

50. You want to fence a field. What shape is ideal which will allow same area but decrease cost of fencing because of less perimeter?

- (A) Circular
- (B) Rectangular
- (C) Triangular
- (D) Perfect square

