MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY, BATHINDA

Ph.D. Entrance Examination of Mechanical Engineering

Q1	According to kinetic theory of gases, the absolute zero temperature is attained when A. Volume of the gas is zero B. Pressure of the gas is zero C. Kinetic energy of the molecules is zero D. Specific heat of gas is zero
Q2	Mixture of ice and water form a A. Closed system B. Open system C. Isolated system D. Heterogeneous system
Q3	A balloon lifting in air follows the following principle A. Law of gravitation B. Archimedes principle C. Principle of buoyancy D. All of the above
Q4	Rain drops are spherical because of A. Viscosity B. Air resistance C. Surface tension forces D. Atmospheric pressure
Q5	Heat transfer takes place as per A. Zeroth law of thermodynamics B. First law of thermodynamics C. Second law of the thermodynamics D. Kirchoff's law
Q6	The insulation ability of an insulator with the presence of moisture would A. Increase B. Decrease C. Remain unaffected D. May increase/decrease depending on temperature and thickness of insulation
Q7	When the steel is normalized, its A. Yield point increases B. Ductility decreases C. Ultimate tensile strength increases D. All of these
Q8	Macrostructure of a material is, generally, examined by A. Naked eye B. Optical microscope C. Metallurgical microscope D. X-ray techniques
Q 9	For a simply supported beam with a central load, the bending moment is A. least at the centre B. least at the supports C. maximum at the supports D. maximum at the centre.

Q10	A member which does not regain its original shape after removed of load producing deformation is said A. plastic B. elastic C. rigid D. none of these.
Q11	The example of rolling pair is A. Bolt and nut B. Lead screw of a lathe C. Ball and socket joint D. Ball bearing and roller bearing
Q12	Crowning on pulleys helps A. In increasing velocity ratio B. In decreasing the slip of the belt C. For automatic adjustment of belt position so that belt runs centrally D. Increase belt and pulley life
Q13	If the intake air temperature of I.C. engine increases, its efficiency will A. Increase B. Decrease C. Remain same D. Unpredictable
Q14	Pick up the wrong statement A. 2-stroke engine can run in any direction B. Petrol engines occupy more space than diesel engines for same power output C. Thermal efficiency of 4-stroke engine is more due to positive scavenging D. Petrol engines work on otto cycle
Q15	Seam welding is A. Multi-spot welding process B. Continuous spot-welding process C. Used to form mesh D. Used for welding cylindrical objects
Q16	The material used for coating the electrode is called A. Protective layer B. Flux C. Slag D. Deoxidiser
Q17	The most commonly used flame in gas welding is A. Neutral B. Oxidising C. Carburising D. All of the above
Q18	Metal in machining operation is removed by A. Tearing chips B. Shearing the metal across a zone C. Distortion of metal D. Cutting the metal across a zone
Q19	The value of Poisson's ratio always remains A. greater than one B. less than one C. equal to one D. none of these

Q20	Tool life is generally better when A. Grain size of the metal is large B. Grain size of the metal is small C. Hard constituents are present in the micro-structure of the tool material D. None of the above
Q21	A free body diagram is a representation of A. The forces on the body B. The reactions on the body C. Both the active and reactive forces D. Neither the active nor the reactive forces
Q22	Thermal power plant works on A. Rankine cycle B. Brayton Cycle C. Carnot Cycle D. Otto Cycle
Q23	The efficiency of Carnot engine depends on A. Working substance B. Design of engine C. Size of engine D. Temperature of source and sink
Q24	In the window air conditioner, the expansion device used is A. Capillary tube B. Thermostatic expansion valve C. Automatic expansion valve D. Float valve
Q25	By a 10 ton press, it is meant that A. The weight of press is 10 ton B. It can handle work weighing upto 10 ton C. It can exert force upto 10 ton D. Turn over per day is 10 mton
Q26	The process of determining the sequence of operation and allocation of facilities is known as A. Aggregate planning B. Scheduling C. Routing D. Forecasting
Q27	Metal patterns are generally used for A. Small castings B. Medium castings C. Complicated casting D. Mass productions of castings
Q28	Kelvin-Planck's law deals with A. Conservation of heat B. Conservation of work C. Conservation of heat into work D. Conservation of work into heat
Q29	The ratio of the maximum displacement of the forced vibration to the deflection due to the static force is known as A. Damping factor B. Damping coefficient C. Logarithmic decrement D. Magnification factor

Q30	The cost of insurance and taxes are included in A. Cost of ordering B. Set up cost C. Inventory carrying cost D. Cost of shortages
Q31	If A is a square matrix of order 3, then the product of A and its transpose is A. Unit matrix B. Zero matrix C. Identity matrix D. Symmetric matrix
Q 32	The maximum and minimum value of $f(x) = 3\sin^2 x + 4\cos^2 x$ is A. (-4, -3) B. (7, 3) C. (4, -3) D. (4, 3)
Q33	The particular integral of $(D^3-4D^2)\,y = 6$ is A. x^2 B. $\frac{3}{4}x^2$ C. $-\frac{3}{4}x^2$ D. $-x^2/4$
Q34	The product of two complex numbers 1+i and 2-5i is A. 7-3i B. 3-4i C. -3-4i D. 7+3i
Q35	If six people sit around a circular table, the probability that two specified persons always sit side by side is A. 14/15 B. 11/15 C. 2/5 D. 4/15
Q36	The standard deviation of 3x+2 is 4, then the variance of x is A. 12 B. 4/3 C. 16/9 D. Can not be determined
Q37	A single die is thrown twice. What is the probability that the sum is neither 8 or 9. A. 1/9 B. 5/36 C. ¼ D. ¾
Q 38	The mean of 25 observations was found to be 38. It was later discovered that 23 and 38 were misread as 25 and 36, then the mean is A. 32 B. 36 C. 38 D. None of these
Q39	What is the order of the differential equation given by dy/dx +4y=sinx? A. 0.5 B. 1 C. 2 D. 0
Q40	If the difference between the mode and median is 2, then find the difference between the median and mean. A. 1 B. 2 C. 3 D. 4

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Answer 1	C
Answer 2	D
Answer 3	D
Answer 4	C
Answer 5	C
Answer 6	B
Answer 7	D
Answer 8	A
Answer 9	D
Answer 10	A
Answer 11	D
Answer 12	C
Answer 13	B
Answer 14	B
Answer 15	B
Answer 16	B
Answer 17	A
Answer 18	B
Answer 19	B
Answer 20	A
Answer 21	C
Answer 22	A
Answer 23	D
Answer 24	A
Answer 25	C
Answer 26	C
Answer 27	D
Answer 28	C
Answer 29	D
Answer 30	C
Answer 31	D
Answer 32	D
Answer 33	C
Answer 34	A
Answer 35	C
Answer 36	C
Answer 37	D
Answer 38	C
Answer 39	B
Answer 40	A

Bhullar