

Day and Date: Friday, 25-03-2022

Total Marks: 50

Time: 11.00 am to 12.00 pm

Answer Key

		Correct Option	
Q. 1)	The cross-section gives a _____ when the cutting plane is parallel to axis of cone.	B	
	A) Parabola		B) Hyperbola
	C) Circle		D) Ellipse
Q. 2)	For the hyperbola, distance between directrix to focus is 90 mm and directrix to vertex is 30 mm . eccentricity of hyperbola is	C	
	A) 90/30		B) 30/60
	C) 60/30		D) None of the above
Q.3)	Drawing pencils are graded according to increase in relative _____	D	
	A) Diameter		B) Colour
	C) Length		D) Hardness
Q. 4)	Match the following. A. $E < 1$ i. Rectangular hyperbola B. $E = 1$ ii. Hyperbola C. $E > 1$ iii. Ellipse D. $E > 1$ iv. Parabola	C	
	A) A, i; B, ii; C, iii; D, iv		B) A, ii; B, iii; C, iv; D, i
	C) A, iii; B, iv; C, ii; D, i		D) A, iv; B, iii; C, ii; D, i
Q. 5)	Choose the correct option.	B	
	A) Eccentricity= distance of point from focus/ distance of point from vertex		B) eccentricity= distance of point from focus/ distance of point from directrix
	C) eccentricity= distance of point from directrix / distance of point from focus		D) eccentricity= distance of point from latus rectum / distance of point from focus
Q. 6)	A line AB, 90mm long, is inclined at 30° to the HP. Its end A is 12mm above the HP and 20mm in front of the VP. Its FV measures 65mm. determine its inclination in degree with the VP.	B	
	A)37		B)44
	C)52		D)60
Q. 7)	If a line AB parallel to both the horizontal plane and vertical plane then the line AB is _____	C	
	A) parallel to profile plane		B) lies on profile plane
	C) perpendicular to profile plane		D) inclined to profile plane

Q. 8)	When the line is parallel to VP and perpendicular to HP, we can get its true length in		C
	A) Front view	B) Side view	
	C) Both 'a' and 'b'	D) Top view	
Q. 9)	When a surface of the plane is inclined to the V.P and an edge is parallel to the V.P and inclined to H.P. The projections are drawn in 3 stages.		A
	A) True	B) False	
	C) Can not say	D) None of the above	
Q. 10)	A line NS, 80mm long has its end N, 10mm above the HP and 15mm in front of the VP. The other end S is 65mm above the HP and 50mm in front of the VP. Draw the projections of the line and find its true inclinations with the HP and VP.		D
	A) $\theta = 52^\circ$, $\phi = 36^\circ$	B) $\theta = 32^\circ$, $\phi = 36^\circ$	
	C) $\theta = 42^\circ$, $\phi = 46^\circ$	D) $\theta = 42^\circ$, $\phi = 26^\circ$	
Q. 11)	Which of the following position is not possible for a right solid?		D
	A) Axis perpendicular to HP and parallel to VP	B) Axis parallel to VP and perpendicular to HP	
	C) Axis parallel to both VP and HP	D) Axis perpendicular to both VP and HP	
Q. 12)	When a solid is placed such that axis is inclined with both the H.P and V.P. Its projections are drawn in _____ stages.		D
	A) 1	B) 4	
	C) 2	D) 3	
Q. 13)	Circular plane of diameter 50 mm inclined 30 degree with HP and parallel to VP. what will length of major axis of ellipse in top view.		D
	A) 35 mm	B) 25 mm	
	C) 45 mm	D) 50 mm	
Q. 14)	The top views of 1 st and 2nd stages of regular cone, has its axis inclined at 30 degrees with H.P while drawing orthographic projections are _____		B
	A) Circle, triangle	B) Circle, triangle with base as ellipse	
	C) Triangle, triangle with base as ellipse	D) Triangle, triangle	
Q. 15)	The front view, side view and top view of a cylinder standing on horizontal plane on its circular base		B
	. A) Circle, rectangle and rectangle	. B) Rectangle, rectangle, Circle	
	C) Rectangle, circle and rectangle	D) None of the above	
Q. 16)	The straight line which are drawn from various points on line contour of an object to meet a plane are called		A
	A) Projectors	B) Perspective line	
	C) Straight line	D) Hidden line	
Q. 17)	Internal angle of regular pentagon is -----		B
	A) 72°	B) 108°	
	C) 150°	D) 120°	
Q. 18)	In 1st angle projection the positions of front and top views are _____		B
	A) top view lies above the front view	B) front view lies above the top view	
	C) front view lie left side to top view	D) top view lie left side to front view	
Q. 19)	The positions of right side view and front view of an object kept in 1st quadrant and projection are drawn?		B

	A) Right side view is right side of front view	B) Right side view is left side of front view	
	C) Right side view is above the front view	D) Right side view is below the front view	
Q. 20)	If an object is placed in 1st quadrant such that one of the surfaces of object is coinciding with vertical plane, what is the correct position of views from the following?		C
	A) The front view touches the reference line	B) The side view touches the reference line	
	C) The top view touches the reference line	D) The bottom view touches the reference line	
Q. 21)	Which method of development is employed in case of prisms?		A
	A) Parallel-line development	B) Approximation method	
	C) Triangulation development	D) Radial-line development	
Q. 22)	The development of the lateral surface of a cylinder is a rectangle having one side equal to the _____ of its base-circle and the other equal to its length.		A
	A) circumference	B) area	
	C) diameter	D) radius	
Q. 23)	The development of lateral surface of a pyramid consists of a number of equal _____ triangle in contact.		B
	A) equilateral	B) isosceles	
	C) scalene	D) right angled	
Q. 24)	The development of the surface of a cube consists of ____ equal squares, the length of the side of the squares being equal to the length of the edge of the cube.		C
	A) 2	B) 4	
	C) 6	D) 8	
Q.25)	Regular cone of base of diameter 30 mm and height of 50 mm is cut by cutting plane with angle of 30° and cut the axis 20 mm from apex then sectional portion is		C
	A) Parabola	B) Hyperbola	
	C) Ellipse	D) Circle	

FE/F.Y.B.Tech. (All Branches) (Part-I) (Sem-I&II) Oct./Nov. 2021 Examination
BASIC MECHANICAL ENGINEERING (CBCS)
Sub. Code: 72510/71820/59942

Day and Date: Friday, 25-03-2022

Total Marks: 50

Time: 02.00 pm to 03.00 pm

Answer Key

		Correct Option	
Q. 1)	In an open system _____	<input type="checkbox"/> B	
	A) Mass of the system remains same		B) Mass and energy transfer takes place across the boundary
	C) Only mass transfer take place across the boundary		D) Only energy transfer take place across the boundary
Q. 2)	In an isolated system _____	<input type="checkbox"/> A	
	A) Mass and energy does not crosses the boundary of the system		B) Mass and energy transfer takes place across the boundary
	C) Only mass transfer across the boundary		D) Only energy transfer across the boundary
Q.3)	A system comprising a single phase is called as _____	<input type="checkbox"/> D	
	A) Closed System		B) Open System
	C) Isolated System		D) Homogeneous System
Q. 4)	Clausius and Kelvin Planks refers to _____	<input type="checkbox"/> B	
	A) First law of Thermodynamics		B) Second law of Thermodynamics
	C) Third law of Thermodynamics		D) Zeroth law of Thermodynamics
Q. 5)	Choose the correct applicable option for steady flow system	<input type="checkbox"/> A	
	A) Mass entering and leaving the system is same		B) Mass does not enter and leave the system
	C) Mass entering the system is more than mass leaving the system		D) None of above
Q. 6)	In two stroke engine, the Suction, Compression, Expansion and Exhaust strokes are completed in _____ revolutions of crank shaft	<input type="checkbox"/> A	

	A) One	B) Two	
	C) Three	D) Four	
Q. 7)	In four stroke S.I. engine, during suction stroke		
	A) Only air is sucked in	B) Only petrol is sucked in	C
	C) Mixture of air & petrol sucked in	D) None of the above	
Q. 8)	The thermal efficiency of petrol engine as compared to diesel engine is		
	A) Lower	B) Higher	A
	C) Same for same power output	D) Same for same speed	
Q. 9)	The compression ratio of the Diesel engine is in the range of _____		
	A) 8-10	B) 10-15	C
	C) 14-20	D) None of the above	
Q. 10)	Cooling of or removal of heat from system is called as _____		
	A) Refrigeration	B) Air Conditioning	A
	C) Space heating	D) All above	
Q. 11)	Heat is rejected by the refrigerant in vapour compression refrigeration system in _____		
	A) Evaporator	B) Throttling Valve	C
	C) Condenser	D) Compressor	
Q. 12)	The temperature of air measured by ordinary thermometer when placed in air is called _____		
	A) Dry bulb temperature	B) Wet bulb temperature	A
	C) Dew point temperature	D) Adiabatic saturation temperature	
Q. 13)	Choose the correct statement		
	A) Dew point temperature can be measured with thermometer	B) Dew point temperature is the saturation temperature corresponding to partial pressure of water vapour in moist air	B
	C) Dew point temperature is same as thermodynamic wet bulb temperature	D) Dew point temperature is same as thermodynamic wet bulb temperature for saturated air	
Q. 14)	_____ sources of Energy are being used from many decades		
	A) Conventional energy	B) Non-conventional energy	A
	C) Primary energy	D) Fuel cells	

Q. 15)	_____ is used as working fluid in steam power plant		A
	A) Steam	B) Oxygen	
	C) Mercury	D) Water	
Q. 16)	Sources of biogas are		D
	A) Any organic waste	B) Sewage	
	C) Cattle dung and animal waste	D) All above	
Q. 17)	_____ part of flat plate collector is coated with black colour		A
	A) Absorber plate	B) Water tubes	
	C) Transparent cover	D) Insulation	
Q. 18)	The suitable material for belt in agricultural machinery is		B
	A) Leather	B) Rubber	
	C) Cotton duck	D) Balata gum	
Q. 19)	Following type of chain is used in motorcycle		A
	A) Roller	B) Silent	
	C) Link	D) None of the above	
Q. 20)	As compared to belt drive, the chain drive transmits		A
	A) More power	B) Less power	
	C) Same power	D) None of the above	
Q. 21)	When the axes of two shafts are perpendicular and intersecting, use		B
	A) Spur gears	B) Bevel gears	
	C) Worm gears	D) Helical gears	
Q. 22)	Lathe machines are basically used for _____		A
	A) Metal Removing	B) Metal joining	
	C) Casting	D) None of above	
Q. 23)	Why metal removal process is costly?		C
	A) More energy is required	B) Some of the material is wasted	
	C) both a) and b)	D) None of the mentioned	
Q. 24)	----- form of metal is used in casting process		A
	A) Liquid	B) Solid	
	C) Gas	D) Plastic	

Q. 25	For ARC Welding		C
	A) AC with High frequency is used	B) AC with low frequency is used	
	C) DC is used	D) All above	

FE/F.Y.B.Tech. (All Branches) (Part-I) (Sem-I&II) Oct./Nov. 2021 Examination
BASIC ELECTRICAL ENGINEERING (CBCS)
Sub. Code: 71812/59178

Day and Date: Thursday, 24-03-2022

Total Marks: 50

Time: 11.00 am to 12.00 pm

Answer Key

		Correct Option
Q. 1)	As per Ohm's law, the mathematical proportionality is -	
	A) $V \propto I$	B) $I \propto 1/R$
	C) $R \propto 1/I$	D) All of the above
Q. 2)	The S.I. unit of Electrical Power is -	
	A) Henry	B) Coulomb
	C) Watt	D) Watt-hour
Q. 3)	Which of the following circuit elements will oppose the change in circuit current?	
	A) Capacitance	B) Inductance
	C) Resistance	D) All of these
Q. 4)	Two resistances 8 ohm & 4 ohm are connected in series across a battery of 12 volt. Then power dissipated in 8 ohm resistance is -	
	A) 8 Watt	B) 4 Watt
	C) 12 Watt	D) 1 Watt
Q. 5)	The unit of Reluctance in a magnetic circuit is -	
	A) weber	B) Ampere turn/weber
	C) weber/m ²	D) Ampere/meter
Q. 6)	A magnetic fringing effect can be minimized by making -	
	A) Narrow shape of pole face	B) Minimizing number of turns
	C) Maximizing number of turns	D) None of the above
Q. 7)	Relative permeability(μ_r) of air gap is -	
	A) 0.5	B) 1
	C) 2	D) 0.25
Q. 8)	What is MMF?	
	A) Magnetic Machine Force	B) Magneto motive Force
	C) Magnetic Motion Force	D) Magneto motion Force
Q. 9)	In an inductive circuit, when frequency increases then Reactance value -	
	A) Increases	B) Decreases
	C) Remains the same	D) Becomes zero
Q. 10)	Current drawn by the purely capacitive circuit is -	
	A) $I_m \sin wt$	B) $I_m \sin (wt + 90)$
	C) $I_m \sin (wt - 90)$	D) None of the above
Q. 11)	The Average value of Voltage ($V_{avg.}$) in an AC is -	
	A) $V_{avg.} = 0.637 V_m$	B) $V_{avg.} = 0.707 V_m$
	C) $V_{avg.} = 1.11 V_m$	D) $V_{avg.} = 1.141 V_m$

Q. 12)	In RLC series circuit, the Impedance (Z) = Resistance (R), when -		C
	A) $X_L < X_C$	B) $X_L > X_C$	
	C) $X_L = X_C$	D) None of the above	
Q. 13)	In a 3 Phase Star connected circuit		C
	A) $V_L = V_{ph}$	B) $V_L = 3V_{ph}$	
	C) $V_L = \sqrt{3} V_{ph}$	D) None of the above	
Q. 14)	In a delta-connected load, the relation between line voltage and the phase voltage is?		C
	A) Line voltage > Phase voltage	B) Line voltage < Phase voltage	
	C) Line voltage = Phase voltage	D) Line voltage \geq Phase voltage	
Q. 15)	In a balanced three-phase load, each phase has		A
	A) An equal amount of power	B) One-third of total power	
	C) Two-thirds of total power	D) A power equal to $\sqrt{3} V_L I_L$	
Q. 16)	In a three-phase system, the voltages are separated by		C
	A) 45°	B) 90°	
	C) 120°	D) 180°	
Q. 17)	In Pipe Earthing, the material used for the Earth electrode is -		C
	A) Aluminum	B) Steel	
	C) Galvanized Iron	D) Copper	
Q. 18)	Which of the following lamp is used for residential application		D
	A) LED	B) CFL	
	C) Fluorescent Tube	D) All of the above	
Q. 19)	The drawback of HRC fuse is -		D
	A) Replacement after every use	B) Produces heat during fusing	
	C) Costly than rewirable fuse	D) All of the above	
Q. 20)	Which of the following is not a characteristic of LED?		B
	A) Fast action	B) High Warm-up time	
	C) Low operational voltage	D) Long life	
Q. 21)	A transformer converts -		D
	A) AC to DC	B) DC to AC	
	C) Step up or step down DC voltage & current	D) Step up or step down AC voltage & current	
Q. 22)	A step-down transformer decreases.....A) Voltage B) Current C) Power D) Frequency		A
	A) Voltage	B) Current	
	C) Power	D) Frequency	
Q. 23)	The transformation ratio (K) of a transformer is -		D
	A) V_1/V_2	B) N_1/N_2	
	C) I_2/I_1	D) All of the above	
Q. 24)	A transformer, No load primary current (I_0) has two components, magnetizing component and active components. The active component is given by-		A
	A) $I_0 \cos \Phi_0$	B) $I_0 \sin \Phi_0$	
	C) $I_0 \cot \Phi_0$	D) $I_0 \tan \Phi_0$	
Q. 25)	A 10KVA, 3300/210 V, 50 Hz single phase transformer has 500 turns on the secondary winding and is supplied from 210 V. Assuming an ideal transformer, the Maximum value of flux in the core is -		B
	A) 1.89 wb	B) 29.7 wb	
	C) 2.97 wb	D) 18.9 wb	

FE/F.Y.B.Tech. (All Branches) (Part-I) (Sem-I&II) Oct./Nov. 2021 Examination

FUNDAMENTALS OF ELECTRONICS AND COMPUTER PROGRAMMING (CBCS)

Sub. Code: 72508 / 71818 / 59940

Day and Date: Thursday, 24-03-2022

Total Marks: 50

Time: 02.00 pm to 03.00 pm

Answer Key

		Correct Option
Q. 1)	For proper biasing of transistor for amplification, the emitter base junction should be biased and collector base junction should be	D
	Biased	
	A) forward, forward B) reversed, forward C) reversed, forward D) forward, reversed	
Q. 2)	Input characteristics of transistor is a graph of _____	A
	A) input current Vs input voltage at constant output voltage B) input power Vs input power at constant output power C) input current Vs input voltage at constant output current D) input current Vs input voltage at constant output power	
Q.3)	Generally Zener diode is always connected in	A
	A)reverse biased B)forward biased C) zero biased D) none of the above	
Q. 4)	$I_C = [\alpha / (1 - \alpha)] I_B + \dots\dots\dots$	A
	A) I_{CEO} B) I_{CBO} C) I_C D) I_E	
Q. 5)	The NOR gate output will be high if the two inputs are _____	A
	A) 0, 0 B) 0, 1 C) 1, 0 D) 1, 1	
Q. 6) NOT gates are available in a single IC 7404.	C
	A) 2 B) 4 C) 6 D) 8	
Q. 7)	Full adder logic circuit can be constructed using	D
	A) AND, OR, NOT gates B) using only NAND gate C) using only NOR gate D) All of above	
Q. 8)	Among which of the logic family propagation Delay Time is lowest	B
	A) TTL B) ECL C) MOS D) CMOS	
Q. 9)	Which of the following is digital transducer	A
	A)Encoder B)Thermistor C)Strain gauge D)LVDT	
Q. 10)	A strain gauge transducer convert	B
	A)Pressure into a change of resistance B)Mechanical displacement into a	

		change of resistance	
	C) Force into a displacement	D) Pressure into displacement	
Q. 11)	Which of the following is used as power source in Microwave Oven		B
	A) Waveguide	B) Magnetron	
	C) Battery	D) Oil	
Q. 12)	In Electronic Weighing Machine generally following transducer is used		C
	A) RTD	A) LVDT	
	C) Strain Guage	C) Temperature Transducer	

Q. 13)	The execution of statement (s) depending upon condition test is known as-		B
	A) Iteration	B) Selection	
	C) Sequence	D) None of these	
Q. 14)	The _____ symbol is used to represent process in flowchart.		C
	A) Circle	B) Diamond	
	C) Rectangle	D) None of these	
Q. 15)	Such use of the computer through which we can write a letter, article, book, or prepare a report is called		B
	A) operating system	B) word processing	
	C) data management	D) managing system	
Q. 16)	What is a protocol?		B
	A) Keynotes and information about the internet.	B) set of rules and regulation that governs proper data communication amongst users	
	C) methodologies to send and receive data amongst users.	D) set of instructions for the prevention of outsourcing hackers.	
Q. 17)	The word processing feature that catches most random typographical errors and misspellings is known as _____.		B
	A) Grammar checker	B) Spell checker	
	C) Word checker	D) None of the these	
Q. 18)	What are five main components of a computer system?		D
	A) CPU, CD-ROM, Mouse, Keyboard, Sound card	B) Memory, Video card, Monitor, Software, Hardware	
	C) Modem, Keyboard, Word Processor, Printer, Screen	D) CPU, Memory, System bus, Input, Output	
Q. 19)	Which of the following is an input device?		D
	A) Plotter	B) Printer	
	C) VDU	D) Mouse	
Q. 20)	The period of _____ generation was 1952-1964.		B
	A) 1 st	B) 2 nd	
	C) 5 th	D) 4 th	
Q. 21)	Which of the following computer generation uses concept of artificial intelligence?		D
	A) First Generation	B) Second Generation	
	C) Third Generation	D) Forth Generation	
Q. 22)	The octal equivalent of 1100101.001010 is _____		B
	A) 624.12	B) 145.12	
	C) 154.12	D) 145.21	
Q. 23)	Convert the binary equivalent 10101 to its decimal equivalent.		A
	A) 21	B) 12	
	C) 22	D) 31	
Q. 24)	What could be the maximum value of a single digit in an octal number system?		B
	A) 8	B) 7	

	C) 6	D) 5	
Q. 25)	_____ is a program that converts high-level language to assembly language.		
	A)Assembler	B)Compiler	B
	C)Interpreter	D)Linker	

**FE/F.Y.B.Tech. (All Branches) (Part-I) (Sem-I&II) Oct./Nov. 2021 Examination
APPLIED MECHANICS (CBCS)**

Sub. Code: 72509/71819/59941

Day and Date: Wednesday, 23-03-2022

Total Marks: 50

Time: 02.00 pm to 03.00 pm

Answer Key

		Correct Option
Q. 1)	Forces are called coplanar when all Forces acting on body lie on	
	A) One point	B) One Plane
	C) Different Plane	D) Perpendicular plane
Q. 2)	The resultant of two forces of same magnitude acting in opposite direction will be	
	A) $2 \times F$	B) Zero
	C) $F/2$	D) $0.707 F$
Q.3)	If two Forces F_1 & F_2 are acting at an angle of 180 degrees than the Resultant is given by $R=$	
	A) $R= F_1+F_2$	B) $R= F_1-F_2$
	C) $R= F_1/F_2$	D) none of above
Q. 4)	Algebraic sum of moment of all forces about a point is equal to moment of resultant force about same point is statement of	
	A) Polygon Law	B) Law of transmissibility
	C) Varignons theorem	D) Lamis theorem
Q. 5)	Lami's theorem states that	
	A) Three forces acting at a point will be in equilibrium	B) Three forces acting at a point can be represented by a triangle, each side being proportional to force
	C) If three forces acting upon a particle are represented in magnitude and direction by the sides of a triangle, taken in order, they will be in equilibrium	D) If three forces acting at a point are in equilibrium, each force is proportional to the sine of the angle between the other two
Q. 6)	U.D.L stands for?	
	A) Uniformly diluted length	B) Uniformly developed load
	C) Uniaxial distributed load	D) Uniformly distributed load
Q. 7)	A beam which extends beyond its supports can be termed as _____	
	A) Overhanging beam	B) Over span beam

	C) Isolated beams	D) Tee beams	
Q.8)	Reaction of a roller support is always		C
	A) Parallel to Roller Surface	B) Depends on Loading	
	C) Normal to Roller Surface	D) In any Direction	
Q.9)	Virtual work is a product of a) Virtual Force & Displacement b) Force & Virtual Displacement		A
	A) Both statement a & b are true	B) statement a is true & b is false	
	C) Both statement a & b are false	D) statement b is true & a is false	
Q.10)	The units of moment of inertia of an area are		B
	A) $\text{kg}\cdot\text{m}^2$	B) m^4	
	C) kg/m^2	D) m^3	
Q.11)	Moment of inertia of a triangular section of base (b) and height (h) about an axis through its base, is		C
	A) $bh^3/4$	B) $bh^3/8$	
	C) $bh^3/12$	D) $bh^3/36$	
Q.12)	Find moment of inertia of rectangle having width $b=3\text{cm}$ and Depth is $d=5\text{cm}$ about centroidal axis		D
	A) 9.95cm^4	B) 14.85cm^4	
	C) 8.45cm^4	D) 31.25cm^4	
Q. 13)	What is the formula of theorem of perpendicular axis?		C
	A) $I_{zz} = I_{xx} - I_{yy}$	B) $I_{zz} = I_{xx} + Ah^2$	
	C) $I_{zz} - I_{xx} = I_{yy}$	D) $I_{zz} = I_{xx} - Ah^2$	
Q. 14)	A body is said to be in Absolute motion when the motion is described with respect to a		B
	A) moving reference	B) fixed reference	
	C) both moving & fixed reference	D) none of above	
Q. 15)	D' Alembert's principle is used for		A
	A) Reducing the problem of kinetics to equivalent statics problem	B) Determining stresses in the truss	
	C) Reducing the problem of kinematics to equivalent statics problem	D) Designing safe structures	
Q. 16)	Joule is the unit of		C
	A) Power	B) Impulse	
	C) Work	D) Momentum	
Q. 17)	Which of the following factors are related by work energy principle?		C
	A) force, displacement and time	B) force, velocity, time and mass	
	C) force, velocity, displacement	D) displacement, time and mass	
Q. 18)	When a vehicle is moving in a circular path on a banked road determine lowest speed of car considering condition of overturning		D
	A) $\sqrt{\mu rg}$	B) $\sqrt{grb/2h}$	
	C) $\sqrt{rg(\mu + \tan\alpha/1 - \mu \tan\alpha)}$	D) $\sqrt{rg(B + 2h \tan\alpha/2h - B \tan\alpha)}$	
Q. 19)	When a vehicle is moving in a circular path on a level road determine lowest speed of car considering condition of skidding		A
	A) $\sqrt{\mu rg}$	B) $\sqrt{grb/2h}$	
	C) $\sqrt{rg(\mu + \tan\alpha/1 - \mu \tan\alpha)}$	D) $\sqrt{rg(B + 2h \tan\alpha/2h - B \tan\alpha)}$	
Q. 20)	In order to keeps a body moving in a circle there exists a Force on it that is directed towards center of the circle. That force is known as		A
	A) centripetal Force	B) centrifugal Force	
	C) Magnetic Force	D) gravitational force	
Q. 21)	A man weighing W Newton entered a lift which moves with an acceleration of a m/s^2 .		

	Find the Force exerted by the man on the floor if lift is moving downward. Acceleration due to gravity is represented by g .	
	A) $W(1-a/g)$	B) $W-a/g$
	C) $W(1+a/g)$	D) $W+a/g$
Q. 22)	A ball is dropped from a height of 2.25 m on a smooth floor and rises to a height of 1.00 m after the bounce. The coefficient of restitution between the ball and the floor is	
	A) 0.33	B) 0.44
	C) 0.57	D) 0.67
Q. 23)	If the velocities of colliding bodies are directed along a long line of impact the impact is called	
	A) Direct Impact	B) Eccentric Impact
	C) Oblique Impact	D) Line of Impact
Q. 24)	A ball of mass 1 kg moving with a velocity of 2 m/sec collides a stationary ball of mass 2 kg and comes to rest after impact. The velocity of the second ball after impact will be	
	A) 0	B) 1 m/s
	C) 2 m/s	D) 0.5 m/s
Q. 25)	A heavy elastic ball dropped from the ceiling of a room & after rebounding twice from the Floor reaches a height of equal to one half of ceiling. Find coefficient of restitution	
	A) 0.8	B) 0.84
	C) 0.7	D) 0.74
		A
		D
		A
		B
		B

BASIC CIVIL ENGINEERING (CBCS)

Sub. Code: 71813/59179

Day and Date: Wednesday, 23-03-2022

Total Marks: 50

Time: 11.00 am to 12.00 pm

Answer Key

		Correct Option
Q. 1)	Prospect of building means.....	
	A) Positioning of doors & windows	B) Positioning of major axis
	C) Orientation of building	D) Overall economy
Q. 2)	The placing of various rooms or units of a structure in proper correlation of their functions and in due proximity with each other is known as _____	
	A) Aspect	B) Prospect
	C) Circulation	D) Grouping
Q.3)	The branch of Civil engineering which deals with artificial supply of water to the crops is termed as	
	A) Irrigation Engineering	B) Transportation Engineering
	C) Surveying	D) Fluid Mechanics
Q. 4)	If the wall or column under construction is near some other property, it will not be possible to spread the footing to both the sides of wall or column. In such case which footing is used?	
	A) Simple pad footing	B) Eccentric footing
	C) Isolated footing	D) Reinforced footing
Q. 5)	Foundations can be broadly classified under _____	
	A) Shallow & deep foundation	B) Pile foundation
	C) None of the mentioned	D) All of the mentioned
Q. 6)	D.P.C (Damp Proof Course) is mainly laid on:	
	A) Footing	B) Floor
	C) Foundation	D) Plinth
Q. 7)	Live loads, with time can vary in:-	
	A) Magnitude	B) Position
	C) Neither position nor magnitude	D) Position as well as magnitude
Q. 8)	As per aspect, which unit should be placed towards east direction	
	A) Study Room	B) Bed room
	C) Kitchen	D) Living room
Q. 9)	Concrete is ----- in compression and -----in tension	
	A) strong, Weak	B) Weak, Strong
	C) Weak, Weak	D) None of above

Q. 10)	_____ wall is constructed in order to support load other than its own.		C
	A) Load supporting	B) Load distributing	
	C) Load bearing	D) Load releasing	
Q. 11)	A _____ foundation is a special type of foundation, generally provided for columns of Bridges		A
	A) Caission	B) Grillage	
	C) Inverted arch	D) Combine	
Q. 12)	A _____ usually parallel to the plot boundaries of residential buildings and laid down by the Authority, beyond which nothing can be constructed towards the site boundaries.		A
	A) Building line	B) Control Line	
	C)Property Line	D)Boundary Line	
Q. 13)	The survey which is carried for areas covering small distance where the curvature of earth is not taken into account are known as:		C
	A)Preliminary survey	B) Geodetic Survey	
	C) Plane Survey	D) Final Survey	
Q. 14)	If Scale is 1Cm = 3 m , what is R.F ?		C
	A) 1:3	B) 1:30	
	C) 1:300	D)1:3000	
Q. 15)	The system in which Values of bearing are between 0° and 360° is called		A
	A) Whole Circle Bearing System	B) Quadrantal Bearing System	
	C) Reduced Bearing System	D) Both B and C	
Q. 16)	The 1 st reading taken On Bench Mark is called:		D
	A) End sight	B) Intermediate sight	
	C) Fore sight	D) Back sight	
Q. 17)	Main function of fastening is		A
	A)To join rails with sleeper	B)To join the two rails together	
	C)Both A and B	D)None of these	
Q. 18)	Angle between survey line and true meridian is called:		A
	A) True Bearing	B) Magnetic Bearing	
	C) Arbitrary Bearing	D) Survey line	
Q. 19)	Which is lowermost layer a of Rigid Pavement		C
	A)Sub- Base	B) Base Course	
	C)Subgrade	D) Concrete	
Q. 20)	If fore bearing of a line is 195°, what will be its back bearing ?		B
	A)35°	B) 15°	
	C)25°	D) 45°	
Q. 21)	The point which indicates shift of the instrument is called		D
	A)Bench mark	B)1st station	
	C)last station	D)Change point	
Q. 22)	Turning the foot screw and bringing the bubble at centre of bubble tube is called		D
	A) Focusing the Object glass	B) Focusing the Eyepiece	
	C) Centering	D) Leveling	
Q. 23)	What is the height of instrument, if elevation of benchmark is 300 m, back sight is 2.110 m, foresight is 1.835 m?		A

	A)302.110 m	B)301.835 m	
	C)297.89 m	D)298.165 m	
Q. 24)	Which of the following is a classification of pavements?		D
	A) Rigid pavement	B) Flexible pavement	
	C) Load pavement	D) Both of A and B	
Q. 25)	Water supply system includes		D
	A) Collection, transportation of water	B)Treatment of water	
	C) Distribution of water to consumers	D) All of these	

Answer Key

		Correct Option
Q. 1)	If the differential equation $(a \tan y + x) dx + (2x \sec^2 y - 3y) dy = 0$ is exact then the constant a is ...	
	A) a = 2	B) a = 3
	C) a = -2	D) a = -3
Q. 2)	If the differential equation $(y + \sin x) dx + (x - 2e^y) dy = 0$ is exact then the solution is .	
	A) $xy + \cos x - 2e^y = c$	B) $xy - \cos x - e^y = c$
	C) $xy - \cos x - 2e^y = c$	D) $y^2 - \cos x - 2e^y = c$
Q.3)	The Integrating Factor for the differential equation $y(1 + 2xy)dx + x(1 - xy) dy = 0$ is ...	
	A) $1/3x^2y^2$	B) $3x^2y^2$
	C) $1/y^2$	D) $1/x^2$
Q. 4)	The Integrating Factor for the differential equation $(3xy^2 - y^3) dx - (2x^2y - xy^2) dy = 0$ is ...	
	A) $1/x^2y^2$	B) x^2y^2
	C) $1/xy^2$	D) $1/x^2y$
Q. 5)	The solution of the differential equation $\frac{dy}{dx} - \frac{y}{x} = x$ is ...	
	A) $y + x^2 = xc$	B) $xy - x^2 = c$
	C) $y - x = xc$	D) $y - x^2 = xc$
Q. 6	The Integrating Factor for the differential equation $\frac{dy}{dx} + y \tan x = \sec x$ is ...	
	A) $\sec x$	B) $\cos x$
	C) $\sin x$	D) $\log \sec x$
Q. 7	Using Euler's method to solve the differential equation $\frac{dy}{dx} = 2 + \sqrt{xy}$ at $x=2$ in five steps with $y(1)=1$ taking $h = 0.2$ the approximate value of y_2 is	
	A) 1	B) 1.6
	C) 2.2771	D) 3.0342

Q. 8	In Euler's modified method which of the following is true.		B
	A) $y_1^{(2)} = y_0 + h f(x_0, y_0)$	B) $y_1^{(2)} = y_0 + \frac{h}{2} [f(x_0, y_0) + f(x_1, y_1^{(1)})]$	
	C) $y_1^{(2)} = y_0 + \frac{h}{2} [f(x_0, y_0) + f(x_1, y_1^{(0)})]$	D) $y_1^{(2)} = y_0 + \frac{h}{2} [f(x_0, y_0) - f(x_1, y_1^{(1)})]$	
Q. 9	Using R-K method to solve the differential equation $dy/dx = 0.31 + 0.25y + 0.3x$ at $x=0.2$ with $h=0.2$ and $y(0) = 0.72$ then the value of k_2 is		B
	A) 0.980	B) 0.1065	
	C) 0.1067	D) 1.1065	
Q. 10	While solving the differential equation $dy/dx = y - xy$ with $y = 2$ when $x = 0$ by using Taylor's Series method then what is value y'''_0		B
	A) 4	B) - 4	
	C) 0	D) - 3	
Q. 11	Using Euler's modified method to solve the differential equation $\frac{dy}{dx} = x^2 + y$ at $x=0.1$ with $h=0.1$ and $y(0) = 0.94$ the approximate value of $y_1^{(1)}$ is ...		D
	A) 1.0395	B) 0.0392	
	C) 1.3209	D) 1.0392	
Q. 12	Find the approximated value of x till third iterations for $x^3 - 5x + 1 = 0$ using Bisection Method. Where root lies in the interval(0 , 1)		A
	A) 0.125	B) 1.125	
	C) 0.75	D) 0.5	
Q. 13	Find the approximated value of x till second iterations for $x \log_{10} x = 1.2$ using Bisection Method. Where root lies in the interval (2 , 3)		D
	A) 2.25	B) 2.5	
	C) 0.75	D) 2.75	
Q. 14	Find the approximated value of x_2 using Secant Method for the equation $x^4 = 32$ where the root lies between 2 and 3		B
	A) 2.2425	B) 2.2462	
	C) 2.2546	D) 2.5	
Q.15	The equation $f(x)$ is given as $x e^x - 2 = 0$. Considering the initial approximation at $x = 0$ then by Newton Raphson method the value second approximation is ...		B
	A) 2	B) 1.4236	
	C) 1.035	D) 1.0338	
Q.16	The Iterative formula for Newton Raphson method is given by _____		A
	A) $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$	B) $x_n = x_{n+1} - \frac{f(x_n)}{f'(x_n)}$	
	C) $x_n = x_n + \frac{f(x_n)}{f'(x_n)}$	D) $x_{n+1} = x_n + \frac{f(x_n)}{f'(x_{n+1})}$	

Q.17	The value of $\int_0^{\infty} e^{-x^4} dx$ is		C
	A) $\sqrt{\frac{1}{4}}$	B) $\sqrt{\frac{3}{4}}$	
	C) $\frac{1}{4} \sqrt{\frac{1}{4}}$	D) $\sqrt{\frac{1}{2}}$	
Q.18	The value of $\sqrt{\frac{15}{2}}$ is		D
	A) $\frac{13135}{16}$	B) $\frac{3003\sqrt{\pi}}{128}$	
	C) $150150\sqrt{\pi}$	D) $\frac{135135\sqrt{\pi}}{128}$	
Q.19	What is the value of $\beta\left(\frac{3}{2}, \frac{1}{2}\right)$?		C
	A) π	B) 2π	
	C) $\pi/2$	D) $\pi/4$	
Q.20	What is the value of $\int_0^{\pi/2} \sqrt{\cot\theta} d\theta$		C
	A) $2\sqrt{\pi}$	B) $\sqrt{\pi}/2$	
	C) $\pi/\sqrt{2}$	D) $\sqrt{2}/\pi$	
Q.21	Which of the following is not true about Error function?		A
	A) $\operatorname{erf}(-x) = \operatorname{erf}(x)$	B) $\operatorname{erfc}(-x) = 1 + \operatorname{erf}(x)$	
	C) $\operatorname{erf}(x) - \operatorname{erfc}(-x) = -1$	D) $\operatorname{erf}(x) + \operatorname{erfc}(x) = 1$	
Q.22	The value of $\int_0^1 \int_0^1 \frac{1}{(1+x^2)(1+y^2)} dx dy$ is ...		C
	A) $\pi^2/8$	B) $\pi^2/4$	
	C) $\pi^2/16$	D) 0	
Q.23	The value of $\int_0^2 \int_0^x xy dy dx$ is		A
	A) 2	B) $\frac{\pi}{2}$	
	C) 16	D) $\pi/16$	
Q.24	The value of $\int_0^1 \int_0^y e^y dy dx$ is		C
	A) 0	B) e - 1	
	C) 1	D) 2	
Q.25	The value of $\int_0^{\pi} \int_0^y \sin x dx dy$ is		D
	A) 0	B) 1	
	C) $\frac{\pi}{2}$	D) $\frac{\pi}{2} - 1$	

FE/F.Y.B.Tech. (All Branches) (Part-I) (Sem-I) Oct./Nov. 2021 Examination

ENGINEERING MATHEMATICS-I (CBCS)

Sub. Code: 71810/59177

Day and Date: Monday, 21-03-2022

Total Marks: 50

Time:11.15 am to 12.15 pm

- Instructions: i) Attempt all questions
 ii) Each question carries 2 marks
 iii) Write the correct option in the box at right
 iv) Use of non-programmable calculator is allowed

		Correct Option	
Q. 1)	The rank of Identity matrix of order m is -----		
	A) 1		B) 0
	C) m		D) $\neq m$
Q. 2)	The system of equations $AX = B$ is inconsistent if -----		
	A) rank of (A) < rank of [A B]		B) rank of (A) = rank of [A B]
	C) rank of (A) > rank of [A B]		D) rank of (A) \leq rank of [A B]
Q.3)	If the rank of matrix $\begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & 1 \\ 0 & 1 & \mu \end{bmatrix}$ is 2 then $\mu =$		
	A) any row number		B) 3
	C) 1		D) 2
Q. 4)	For homogeneous equations $AX = 0$, If A is 4 x4 matrix of rank 1, then for non trivial solution and it requires -----		
	A) three independent parameters		B) one independent parameter.
	C) two independent parameters.		D) none of these .
Q. 5)	The product of eigen values of matrix A is equal to		
	A) $ A $		B) Trace of A
	C) $\frac{1}{ A }$		D) $\frac{1}{\text{Trace of } A}$
Q. 6)	If 2,2,8 are the eigen values of the 3x3 matrix A and $ A = 4k$ then k = -----		
	A) 4		B) 2
	C) 8		D) none of these
Q. 7)	The sum and product of eigen value of the matrix $\begin{bmatrix} 4 & 2 \\ -2 & 1 \end{bmatrix}$ are ----		
	A) 5 and 0		B) 5 and 8
	C) 5 and -8		D) can not be determined
Q. 8)	If the eigen values of a matrix A are $\lambda_1, \lambda_2, \lambda_3$ then eigen values of A^{-1} are		
	A) $1/\lambda_1, 1/\lambda_2, 1/\lambda_3$		B) $\lambda_1, \lambda_2, \lambda_3$
	C) $\lambda_1^2, \lambda_2^2, \lambda_3^2$		D) $1/\lambda_1^2, 1/\lambda_2^2, 1/\lambda_3^2$

Q. 9)	Polar form of $(a+ib)^n$ is	
	A) $r^n (\cos\theta - i\sin\theta)^n$	B) $r^n (\sin\theta + i\cos\theta)^n$
	C) $r^n (\sin\theta - i\cos\theta)^n$	D) $r^n (\cos\theta + i\sin\theta)^n$
Q. 10)	The modulus and the amplitude of $-\frac{1}{2} + \frac{\sqrt{3}}{2}i$ are	
	A) $1, \frac{2\pi}{3}$	B) $2, \frac{2\pi}{3}$
	C) $2, \frac{\pi}{6}$	D) $-2, \frac{\pi}{6}$
Q. 11)	$(\cos 4\theta + i \sin 4\theta) (\cos 5\theta + i \sin 5\theta)$ is equal to	
	A) $\cos 9\theta - i \sin 9\theta$	B) $\cos \theta + i \sin \theta$
	C) $\cos 9\theta + i \sin 9\theta$	D) $\sin \theta - i \cos \theta$
Q. 12)	If $x = \cos \theta + i \sin \theta$ then $x^n + \frac{1}{x^n}$ is equal to	
	A) $2 i \sin n \theta$	B) $2 i \sin^n \theta$
	C) 0	D) $2 \cos n \theta$
Q. 13)	$(\cos \theta + i \sin \theta)^n$ is equal to	
	A) $\sin n \theta + i \cos n \theta$	B) $\sin n \theta - i \cos n \theta$
	C) $\cos n \theta + i \sin n \theta$	D) $\cos n \theta - i \sin n \theta$
Q. 14)	Which of the following is not an iterative method	
	A) Gauss Seidel Method	B) Gauss Jordan method
	C) Jacobi Method	D) None of these
Q. 15)	Find the values of y in the first iteration by Gauss Seidel method for the following system of equations $x = (1/12)(2y - z + 24)$, $y = (1/12)(x + 2z + 6)$, $z = (1/12)(3x + 2y + 4)$	
	A) $y_1 = 2/3$	B) $y_1 = 3/2$
	C) $y_1 = 2/4$	D) None of these
Q. 16)	Find the values of y in the second iteration (i.e. y_2) by Jacobi method for the following system of equations $20x + 2y - z = 6$, $x + 20y + 2z = 8$, $x + 3y + 20z = 4$	
	A) $y_2 = 0.385$	B) $y_2 = 0.365$
	C) $y_2 = 0.375$	D) None of these
Q. 17)	Gauss Elimination method reduces to a original matrix into	
	A) Upper triangular matrix	B) Skew symmetric matrix
	C) Identity matrix	D) None of these
Q. 18)	If f is maximum at point (a,b) then	
	A) $rt - s^2 > 0, r > 0$	B) $rt - s^2 > 0, r < 0$
	C) $rt - s^2 \leq 0, r = 0$	D) None of these
Q. 19)	If $u = x^3 - 3xy^2$ then $\frac{\partial u}{\partial x}$ at (1,1) is	
	A) 0	B) -3
	C) -2	D) None of these
Q. 20)	If $f(x,y) = x^2 - 3xy$ is implicit function and by using $\frac{dy}{dx} = -\frac{\frac{\partial f}{\partial x}}{\frac{\partial f}{\partial y}}$, then $\frac{dy}{dx}$ at (1,1)	
	A) $-1/3$	B) $1/3$

	C) 5/3	D) None of these	
Q. 21)	If $u = x - y$, $v = x^2 + y^2$ then Jacobian of (u, v) w.r.t (x, y) i.e $J[(u, v)/(x, y)] =$		
	A) $-2(x + y)$	B) $2(x - y)$	
	C) $2(x + y)$	D) None of these	
Q. 22)	$\lim_{x \rightarrow a} \frac{\sin(x - a)}{x - a}$ is		
	A) 1	B) 0	
	C) -1	D) None of these	
Q. 23)	$\lim_{x \rightarrow \pi/2} \frac{x - \pi/2}{\cot x}$		
	A) -1	B) 0	
	C) 1	D) None of these	
Q. 24)	Taylors series in terms of h is		
	A) $f(x) = f(a) + hf'(a) + (h^2/2)f''(a) + \dots$	B) $f(x) = f(a) + hf'(a) + (h^2/2)f'''(a) + \dots$	
	C) $f(x) = f(a) + hf'(a) + (h^2/2)f'''(a) + \dots$	D) None of these	
Q. 25)	Expansion of a^x by Maclaurins series is		
	A) $a^x = 1 + x(\log a) + (x^2/2!)(\log a)^2 + \dots$	B) $a^x = 1 - x(\log a) + (x^2/2!)(\log a)^2 + \dots$	
	C) $a^x = 1 - x(\log a) - (x^2/2!)(\log a)^2 + \dots$	D) None of these	

FE/F.Y.B.Tech. (All Branches) (Part-I) (Sem-I&II) Oct./Nov. 2021 Examination
ENGINEERING CHEMISTRY (CBCS)
Sub. Code: 72507/71817/59939

Day and Date: Tuesday, 22-03-2022

Total Marks: 50

Time: 02.00 pm to 03.00 pm

Answer Key

		Correct Option	
Q. 1)	What is Total hardness of water sample containing $\text{Ca}(\text{HCO}_3)_2=81\text{ppm}$ $\text{MgCO}_3=73\text{ppm}, \text{CaCl}_2=55.5\text{ppm}, \text{MgCl}_2=47.5\text{ppm}$	D	
	A)57.54ppm		B)58.11ppm
	C)60.20ppm		D)200ppm
Q. 2)	Precipitate formed inside the boiler is hard adherent coating it is known as	A	
	A) Scale		B) Foaming
	C) Sludge		D) Priming
Q.3)	The goal of Green Chemistry is to design process which result in.....of raw material so that it gets maximum desire product.	C	
	A)Minimum utilization		B) low utilization
	C) Maximum utilization		D) All of the above
Q. 4)	What is Non carbonate hardness of water sample containing $\text{Ca}(\text{HCO}_3)_2=41\text{ppm}$ $\text{MgCO}_3=44\text{ppm}, \text{CaCl}_2=27\text{ppm}, \text{CaSO}_4=26\text{ppm}.$	A	
	A)43.44ppm		B)125 ppm
	C)45.11ppm		D)200ppm
Q. 5)	Addition of 1% Carbon to Iron increases strength of Iron by	A	
	A) 10 times greater		B) 15 times greater
	C) 10 times less		D) None of the above
Q. 6)	Single beam spectrophotometer measures	C	
	A)absorbance		B)radiation
	C)light intensity		D)none of the above
Q. 7)	Styrene butadiene rubber is formed by	B	
	A)condensation polymerization		B)co-polymerization
	C) addition polymerization		D)None of these
Q. 8)	Paper chromatography is.....type of chromatography	B	
	A)solid-liquid		B)liquid-liquid
	C)solid - gas		D)Gas-liquid
Q. 9)is the alloy of Aluminium	D	
	A)Nichrome		B)Iron

	C) Bronze	D) Duralumin	
Q. 10)is the unit of hardness.		B
	A) Cal/gm	B) Clark degree	
	C) K cal/m ³	D) British Thermal Unit.	
			Correct Option
Q. 11)	Thermo-softening plastics have following type of structure		D
	A) 2D	B) 3D	
	C) 2D & 3D	D) Linear	
Q. 12)	Styrene butadiene rubber is formed by		B
	A) condensation polymerization	B) co-polymerization	
	C) addition polymerization	D) none of the above	
Q.13)	Calorific Value of solid fuel is		C
	A) Highest	B) Medium	
	C) Lowest	D) None of these	
Q. 14)	The example of thermosetting plastic is...		B
	A) Polyethylene	B) Bakelite	
	C) Epoxy Resin	D) Polystyrene	
Q. 15)	Calorific Value of solid fuel is		C
	A) Highest	B) Medium	
	C) Lowest	D) None of these	
Q. 16)	Gross calorific value is measured by		A
	A) Collecting condensate	B) Allowing to escape water vapour	
	C) Cooling fuels	D) Mixing Fuel	
Q. 17)	The high carbon steel is used in making		A
	A) cutting tools	B) roofing sheets	
	C) structures	D) fans	
Q. 18)	Specific gravity of solid fuel is		A
	A) Highest	B) Medium	
	C) Lowest	D) None of these	
Q.19)	Green chemistry is called as		C
	A) Organic chemistry	B) Inorganic Chemistry	
	C) Sustainable Chemistry	D) None of the above	
Q. 20)is the non ferrous alloy of copper with zinc		B
	A) Nichrome	B) Brasses	
	C) Bronze	D) Alnico	
			Correct Option
Q. 21)	The Hardness of water sample determined by.....method		A
	A) titration	B) chromatography	
	C) spectrophotometry	D) gravimetric	
Q. 22)	Corrosion occurs always at		B
	A) Cathode	B) Anode	
	C) Electrode	D) None of these	
Q.23)	The electrolyte used during electroplating is		B
	A) salt solution	B) salt solution of coating metal	

	C)water	D)acid	
Q. 24)	French degree is the unit of		C
	A) Total solids	B) Acidity	
	C) Hardness	D) Water	
Q. 25)	Absorption of O ₂ mechanism is the type of		B
	A)atmospheric corrosion	B)immersed corrosion	
	C)oxidation corrosion	D)erosion	

Day and Date: Tuesday, 22-03-2022

Total Marks: 50

Time: 11.00 am to 12.00 pm

Answer Key

		Correct Option	
Q. 1)	In case of diffraction grating, if 'a' is the width of slit and 'b' is the width of opaque portion, then a + b is called as _____	D	
	A) Grating constant		B) Grating element
	C) Grating space		D) All of the above
Q. 2)	How many orders will be visible if the wavelength of incident light is 6328 \AA and the number of lines per cm on the grating is 6500?	C	
	A) 1		B) 3
	C) 2		D) 4
Q. 3)	A grating has 6000 lines per cm drawn on it. If width of grating is 10cm, then the smallest wavelength separation that can be resolved in the third order in 6000 \AA wavelength region is	C	
	A) 0.33 \AA		B) 3.3 \AA
	C) 0.033 \AA		D) 0.35 \AA
Q. 4)	In a calcite crystal	D	
	A) O-ray moves faster than E-ray		B) E-ray moves faster than O-ray
	C) Both the rays (O and E) have same velocity in a direction along optic axis		D) both (B) and (C) correct
Q. 5)	The property of rotating the plane of vibration of a plane polarized light about its direction of travel possessed by certain substances is called--	B	
	A) birefringence		B) optical activity
	C) chemo luminescence		D) none of the above
Q. 6)	Which are the active centers in ruby laser--	A	
	A) Chromium ions		B) Aluminium ions
	C) Neon atoms		D) Oxygen atoms
Q. 7)	The pumping technique used in case of gas laser is	B	
	A) optical pumping		B) electric discharge
	C) injection current		D) chemical reactions
Q. 8)	The technique by which image is obtained from a hologram is called as _____	C	
	A) Formation		B) Construction
	C) Reconstruction		D) projection

Q. 9)	The ends of the ruby rod work as		C
	A) Pumping source	B) Active medium	
	C) Cavity mirrors	D) All of the above	
Q. 10)	Choose the correct statement: The numerical aperture of a fiber -		B
	A) is a function of the fiber dimension	B) is dependent on the refractive indices of the core and cladding	
	C) is independent on the refractive indices of the core and cladding	D) is a function of length of the optical fiber	
Q. 11)	Stair carpet is used to remove the problem of ---- effect.		C
	A) resonance effect	B) echo	
	C) echelon effect	D) all of the above	
Q. 12)	Which of the following alternative represents Sabine's formula for reverberation time?		B
	A) $T = \frac{0.651V}{\sum aS}$	B) $T = \frac{0.165V}{\sum aS}$	
	C) $T = \frac{\sum aS}{0.651V}$	D) $T = \frac{\sum aS}{0.165V}$	
Q. 13)	The volume of an auditorium is 9500m ³ . The total absorption in the auditorium is 1045 O.W.U. Reverberation time of the auditorium is		D
	A) 1.05 second	B) 1.55 second	
	C) 1.525 second	D) 1.5 second	
Q. 14)	What is the relation between primitives and interfacial angles for cubic structure?		C
	A) All sides are unequal; all angles are unequal.	B) Two sides are equal; all angles are equal with 90°.	
	C) All sides are equal; all angles are equal with 90°.	D) All sides are unequal; two angles are equal with 90°.	
Q. 15)	How many axis of symmetry are possible for cubic crystal Structure?		B
	A) 23	B) 13	
	C) 9	D) 6	
Q. 16)	What is the interplanar spacing for (132) plane in a SC lattice, where the lattice constant is 4.2A.U.		C
	A) 1.40 A ⁰	B) 2.40 A ⁰	
	C) 1.12 A ⁰	D) 1.90 A ⁰	
Q. 17)	Copper has FCC structure and atomic radius is 1.278 A.U. Calculate its density if Atomic weight of copper is 63.54		A
	A) 8939 Kg/m ³	B) 3.6174 Kg/m ³	
	C) 79999 Kg/m ³	D) None of above	
Q. 18)	Small hard balls are allowed to rotate inside a container and then it is made to fall on a solid with a high force to crush the solid into nanoparticles. This principle is used in--		C
	A) sol gel method	B) Bottom-up approach	
	C) Ball milling method	D) Vapor deposition method	
Q. 19)	Scanning tunneling microscope can be used to see image of --		A
	A) Conducting samples	B) Non conducting samples	
	C) Both conducting as well as non-conducting samples	D) None of above	

Q. 20)	Properties of material are different at nano level due to-		C
	A) Increase in surface to volume ratio	B) Quantum size (or quantum confinement) effect	
	C) Both (A) and (B)	D) None of the above	
Q. 21)	Richard Feynman is often credited with predicting the potential of nanotechnology. What was the title of his famous speech given on December 29, 1959?		D
	A) There is a tiny room at the bottom	B) Things get nanoscopic at the bottom	
	C) Bottom? What bottom?	D) There is plenty of room at the bottom.	
Q. 22)	X rays of wavelength 0.15 nm are scattered from a block of carbon. What is the wavelength of X-rays scattered at 0 degree?		A
	A) 0.15 nm	B) 0.154 nm	
	C) 0.165 nm	D) 0.178 nm	
Q. 23)	What is the de-Broglie's wavelength associated with a 2000 kg car having a constant speed 30m/s.		A
	A) $1.105 \times 10^{-38} \text{m}$	B) $3.315 \times 10^{-36} \text{m}$	
	C) $9.93 \times 10^{-40} \text{m}$	D) $0.1105 \times 10^{-32} \text{m}$	
Q. 24)	If the certainty in the position measurement of a particle increases, then the certainty in the momentum measurement of the same particle during simultaneous measurement		B
	A) increases	B) decreases	
	C) is not affected	D) none of these	
Q. 25)	Which of the following statement is not correct?		D
	A) Lighter the matter particle; grater is its de Broglie wavelength.	B) Faster the matter particle, smaller is the wavelength	
	C) Phase velocity of matter wave is greater than the speed of light	D) The phase velocity of matter wave is constant.	