ENGINEERING KNOWLEDGE TEST (EKT)
COMPUTER SCIENCE STREAM

Instructions for Candidates **Time Allotted: 30 Minutes**

1. **Total number of Questions 50. Each Question is of three marks.**
2. **One mark will be deducted for every wrong answer.**
3. **Do not write or mark on Question Paper.**
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Q1. If $\sin x+(\sin x)^2 =1$, then

(a) $\cos x+(\cos x)^2 =1$

(b) $\cos x - (\cos x)^2 =1$

(c) $(\cos x)^2 - (\cos x) =1$

(d) $(\cos x)^2 + (\cos x)^4 =1$

Q2. Each edge of a cube is increased by 50%. The percentage increase in the surface area is

(a) 50

(b) 125

(c) 150

(d) 300

Q3. The value of log 4 + log 5 - log 2 is

(a) 1

(b) 7

(c) 10

(d) 9/2

Q4. The probability of drawing an ace or a spade or both from a deck of cards is

(a) 4/52

(b) 13/52

(c) 1/52

(d) 16/52

Q5. Let θ be the angle between two vectors a and b, then cos θ is equal to

(a) mod a + mod b

(b) (a)+ mod b

(c) mod (a+b)

(d) ab/[mod a x mod b]

Q6. Pressure is

(a) scalar

(b) vector

(c) pseudo vector

(d) Poynting vector

Q7. The force of attraction or repulsion between charges follows

(a) square law

(b) inverse square law

(c) both (a) and (b)

(d) none of (a) and (b)

Q8. The force experienced by a conductor of length L carrying current I placed parallel to the magnetic field of flux density B is

(a) BIL

(b) Zero

(c) HIL

(d) IL/B

Q9. A wave undergoes reflection from a rigid boundary. One of its characteristic parameters that changes is

(a) frequency

(b) phase

(c) velocity

(d) wavelength

Q10. The half-life period of a radioactive element is 140 days . After 560 days one gram of the element will reduce to

(a) 1/2 g

(b) 1/4 g

(c) 1/8 g

(d) 1/16 g

Q11. Which projection shows the object from angles in which the scales along each axis of object are equal

(a) auxiliary projection

(b) isometric projection

(c) orthographic projection

(d) objective projection

Q12. In binary system the value $(111)_2$ is equal to decimal

(a) $(7)_{10}$

(b) $(3)_{10}$

(c) $(5)_{10}$

(d) $(8)_{10}$

Q13. when o/p of a flip-flop is used as clock I/p for next flip-flop the counter is called

(a) ripple counter

(b) asynchronous counter

(c) both (a) and (b)

(d) synchronous counter

Q14. The octal equivalent of $(10011)_2$ is

(a) $(32)_8$

(b) $(52)_8$

(c) $(23)_8$

(d) None of the above

Q15. Which of the following is used as storage locations both in the ALU and the control section of a computer?

(a) accumulator

(b) register

(c) adder

(d) decoder

Q16. The Central Processing Unit (CPU)Consists of:

(a) Input, output and processing units

(b) Control unit, primary storage, and secondary storage

(c) Control unit, arithmetic-logic unit, and primary storage

(d) Control Unit, processing, primary storage

Q17. If some device requires urgent service, normal execution of programs may sometimes be pre-empted using

(a) an interrupt signal

(b) a request to memory modules

(c) DMA

(d) all of the above

Q18. The fan-out capability of a digital building block can be defined as

(a) the number of inputs that one output can transmit to

(b) the amount of cooling required for fanning the hear out

(c) the number of inputs that can transmit to one input

(d) that the unit can scan

Q19. In computer terminology a compiler means

(a) a person who computes source programs

(b) the same thing as a programmer

(c) key punch operator

(d) a program which translates source program into object program.

Q20. The ascending order of a data Hierarchy is :

(a) bit - bytes - field - record - file – database

(b) bit - bytes - record - field - file – database

(c) bytes - bit - field - record - file – database

(d) bytes - bit - record - field - file – database

Q21. The processes at the most detailed level of the data flow diagrams are called

(a) transform descriptions

(b) functional primitives

(c) data flows

(d) interfaces

Q22. A station in a network forwards incoming packets by placing them on its shortest output queue. What routing algorithm is being used?

(a) hot potato routing

(b) flooding

(c) static routing

(d) delta routing

Q23. The action of parsing the source program into the proper syntactic classes is known as

(a) syntax analysis

(b) lexical analysis

(c) interpretation analysis

(d) general syntax analysis

Q24. An Interpreter is

(a) a program that places programs into memory and prepares them for execution

(b) a program that automates the translation of assembly language into machine language

(c) program that accepts a program written in a high level. language and produces an object program

(d) is a program that appears to execute a source program as if it were machine language

Q25. A system program that combines the separately compiled modules of a program into a form suitable for execution

(a) assembler

(b) linking loader

(c) cross compiler

(d) load and go

Q26. A required characteristic of an online real-time system is :

(a) more than one CPU

(b) offline batch processing

(c) no delay in processing

(d) all of the above

Q27. Banker's algorithm for resource allocation deals with

(a) deadlock prevention

(b) deadlock avoidance

(c) deadlock recovery

(d) mutual exclusion

Q28. Situations where two or more processes are reading or writing some shared data and the final result depends on who runs precisely when, are called

(a) race conditions

(b) critical sections

(c) mutual exclusions

(d) message passing

Q29. Which of the following scheduling objectives should be applied to the following: the system should admit jobs to create a mix that will keep most devices busy

(a) to be fair

(b) to balance resource utilization

(c) to obey priorities

(d) to be predictable

Q30. The master list of an indexed file

(a) is sorted in ascending order

(b) contains only a list of keys and record numbers

(c) has a number assigned to each record

(d) both (b) and (c)

Q31. In SQL, which command(s) is(are) used to recompile a stored function?

(a) SET FUNCTION

(b) SET STORED FUNCTION

(c) ALTER FUNCTION

(d) all of the above

Q32. Updating a database means

(a) revising the file structure

(b) reorganizing the database

(c) modifying or adding record occurrences

(d) all of the above

Q33. The relational model uses some unfamiliar terminology. A tuple is equivalent to a

(a) record

(b) field

(c) file

(d) database

Q34. What type of software is most useful in financial planning and calculation?

(a) graphics

(b) communication

(c) database

(d) spreadsheet

Q35. A channel for communicating across a boundary between two or more sub-systems is known as

(a) interface

(b) actigram

(c) walk through

(d) data path

Q36. System prototyping helps the designer in

(a) making the programmers understand how the system will function

(b) communicating to the user, quickly, how the system, when developed, will look and get a feedback

(c) giving a demo of the software, to the system manager to whom he reports

(d) both (a) and (b)

Q37. The physical layer, in reference to the OSI model, defines

(a) data link procedures that provide for the exchange of data via frames that can be sent and received

(b) the interface between the X.25 network and packet mode device

(c) the virtual circuit interface to packet-switched service

(d) all of the above

Q38. Which of the following device copies electrical signals from one Ethernet to another?

(a) bridge

(b) repeater

(c) hub

(d) passive hub

Q39. Which of the following TCP/IP protocol is used for transferring files from one machine to another?

(a) RARP

(b) ARP

(c) TCP

(d) FTP

Q40. What does the acronym ISDN stand for?

(a) Indian Standard Digital Network

(b) Integrated Services Digital Network

(c) Intelligent Services Digital Network

(d) Integrated Services Data Network

Q41. Four bits are used for packet sequence numbering in a sliding window protocol used in a computer network. What is the maximum window size?

(a) 4

(b) 8

(c) 15

(d) 16

Q42. If you get both local and remote echoes, every character you type will appear on the screen

(a) once

(b) twice

(c) three times

(d) never

Q43. Voice signal frequency may lie anywhere between

(a) 0 to 20 KHz

(b) 0 to 1 MHz

(c) 15 Hz to 15 KHz

(d) none of these

Q44. PWM signal can be generated by

(a) a monostable multivibrator

(b) an astable multivibrator

(c) integrating PPM signal

(d) differentiating PPM signal

Q45. What part of the transformer is subjected to maximum heating

(a) core

(b) winding

(c) oil

(d) frame

Q46. The servo motor differs from ordinary motor in that it has

(a) low inertia & high torque

(b) high inertia & high torque

(c) low inertia & low torque

(d) high inertia & low torque

Q47. The speed of DC motor is

(a) always constant

(b) directly proportional to back emf

(c) directly proportional to flux

(d) inversely proportional to the product of back emf and flux

Q48. Negative feedback reduces---------in amplifiers

(a) signal

(b) amplification

(c) distortion

(d) none of the above

Q49. Whenever the two inputs are same the output is high for

(a) EX-OR

(b) EX-NOR

(c) NOR

(d) NAND

Q50. A hard disk is divided into tracks which are further subdivided into

(a) clusters

(b) sectors

(c) vectors

(d) heads

ENGINEERING KNOWLEDGE TEST (EKT)
ELECTRICAL AND ELECTRONICS STREAM

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Q11. Which projection shows the object from angles in which the scales along each axis of object are equal

(a) auxiliary projection

(b) isometric projection

(c) orthographic projection

(d) objective projection

Q12. A charge of 2 coulombs every 0.5 sec signifies

(a) 4 A of current

(b) 1A of current

(c) 2A of current

(d) none of these

Q13. Transformer is a device used for

(a) converting AC to DC

(b) for stepping down AC Voltages

(c) both stepping up/down AC Voltages

(d) only stepping up AC Voltages

Q14. In order to get back the original signal from sampled signal , It is necessary to use

(a) low pass filter

(b) high pass filter

(c) band pass filter

(d) band reject filter

Q15. Superposition theorem can be applied only to circuits having elements

(a) non-linear

(b) passive

(c) linear bilateral

(d) resistive

Q16. Negative feedback reduces---------in amplifiers

(a) signal

(b) amplification

(c) distortion

(d) none of the above

Q17. Whenever the two inputs are same the output is high for

(a) EX-OR

(b) EX-NOR

(c) NOR

(d) NAND

Q18. In digital Electronics a nibble is a collection of

(a) 4 bits

(b) 2 bits

(c) 8 bits

(d) 10 bits

Q19. If both R=1 and S=1 in RS Flip Flop then Q is

(a) last value

(b) set

(c) reset

(d) forbidden

Q20. Ideal OP Amp's input resistance Is

(a) zero

(b) 100 k ohms

(c) Infinite

(d) 15 k ohm

Q21. A hard disk is divided into tracks which are further subdivided into

(a) clusters

(b) sectors

(c) vectors

(d) heads

Q22. Pentavalent impurities gives rise to more number of

(a) electrons in valence band

(b) electrons in conduction band

(c) holes in valence band

(d) holes in conduction band

Q23. A Varactor diode may be advantageous at microwave frequencies

(a) for electronic tuning

(b) as an oscillator

(c) as a parametric amplifier

(d) for frequency multiplication

Q24. When used in a circuit , a zener diode is always

(a) forward biased

(b) connected in series

(c) troubled by overheating

(d) reverse biased

Q25. The output from a laser is monochromatic , this means that it is

(a) infrared

(b) polarised

(c) narrow beam

(d) single frequency

Q26. In pneumatic control system, compensation is provided by

(a) bimetallic strip

(b) extension tube

(c) restriction volume tube

(d) none of the above

Q27. The main drawback of a feedback system is

(a) large time delay

(b) inefficiency

(c) inaccuracy

(d) unreliability

Q28. In an open loop control system

(a) control action is independent of the output

(b) control action depends upon human judgment

(c) internal system changes are automatically taken care of

(d) both (a) and (b)

Q29. Which of the following cannot be used to measure temperature

(a) thermocouple

(b) thermistor

(c) pyrometer

(d) thyristor

Q30. Poles are the complex frequencies of a transfer function where the response becomes

(a) infinite

(b) zero

(c) oscillatory

(d) decaying

Q31. The impulse response of an R-L circuit is a

(a) rising exponential function

(b) decaying exponential function

(c) step function

(d) parabolic function

Q32. The conversion of a signal representation from time domain to frequency domain is given by

(a) Fourier transform

(b) Shannon transform

(c) inverse Fourier transform

(d) inverse Laplace transform

Q33. The sampling theorem states that for a band limited signal of max frequency component f_m

(a) fs>=2fm

(b) fs<=2fm

(c) fs<=2fm

(d) fs=fm

Q34. Voice signal frequency may lie anywhere between

(a) 0 to 20 KHz

(b) 0 to 1 MHz

(c) 15 Hz to 15 KHz

(d) none of these

Q35. Higher beamwidth of antenna implies

(a) higher directivity

(b) lesser directivity

(c) higher bandwidth

(d) lower bandwidth

Q36. PWM signal can be generated by

(a) a monostable multivibrator

(b) an astable multivibrator

(c) integrating PPM signal

(d) differentiating PPM signal

Q37. In broadcast receiver most of the selectivity is achieved in

(a) IF section

(b) RF section

(c) audio stage

(d) mixer

Q38. The IF bandwidth of a radar receiver is inversely proportional to the

(a) pulse width

(b) PRF

(c) pulse Interval

(d) square root of peak transmitted power

Q39. Quantizing noise occurs in

(a) TDM

(b) FDM

(c) PCM

(d) PWM

Q40. In order to separate channels in a FDM receiver it is necessary to use

(a) AND gates

(b) OR gates

(c) integration

(d) band pass filter

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Q45. The following is measure of reproducibility in a measurement

(a) resolution

(b) drift

(c) precision

(d) fidelity

Q46. What part of the transformer is subjected to maximum heating

(a) core

(b) winding

(c) oil

(d) frame

Q47. The servo motor differs from ordinary motor in that it has

(a) low inertia & high torque

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Q48. The speed of DC motor is

(a) always constant

(b) directly proportional to back emf

(c) directly proportional to flux

(d) inversely proportional to the product of back emf and flux

Q49. Which of the following DC generator cannot build up in an open circuit

(a) shunt

(b) series

(c) short shunt

(d) long shunt

Q50. The armature circuit resistance of DC generator is closest to

(a) 1 ohms

(b) 4π ohms

(c) 1000 ohms

(d) 20,000 ohms

ENGINEERING KNOWLEDGE TEST (EKT)
MECHANICAL STREAM

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(a) cos x+(cos x) 2 =1

(b) cos x - (cos x) 2 =1

(c) (cos x) 2 - (cos x) =1

(d) (cos x) 2 + (cos x) 4 =1

Q2. Each edge of a cube is increased by 50%. The percentage increase in the surface area is

(a) 50

(b) 125

(c) 150

(d) 300

Q3. The value of log 4 + log 5 - log 2 is

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(d) 1/16 g

Q11. Specify the sequence correctly

(a) grain growth, recrystallisation, stress relief

(b) stress relief, grain growth, recrystallisation

(c) stress relief, recrystallisation, grain growth

(d) grain growth, stress relief, recrystallisation

Q12. An eutectoid steel consists of

(a) wholly pearlite

(b) wholly austenite

(c) pearlite and ferrite

(d) pearlite and cementite

Q13. Cast iron is a

(a) ductile material

(b) malleable material

(c) brittle material

(d) tough material

Q14. The percentage of carbon in cast iron varies from

(a) 0.1 to 0.5

(b) 0.5 to 1

(c) 1 to 1.7

(d) 1.7 to 4.5

Q15. The hardness of steel depends upon the

(a) amount of cementite it contains

(b) amount of carbon it contains

(c) contents of alloying elements

(d) method of manufacture of steel

Q16. Blast furnace is used to produce

(a) pig iron

(b) cast iron

(c) wrought iron

(d) steel

Q17. For a constant volume process, work done is

(a) zero

(b) positive

(c) negative

(d) none of the above

Q18. Two balls of equal mass and of perfectly elastic material are lying on the floor. One of the balls with velocity *v* is made to strike the second ball. Both the balls after impact will move with a velocity

(a) V

(b) v/2

(c) v/4

(d) v/8

Q19. The velocity ratio in case of an inclined plane inclined at angle θ to the horizontal and weight being pulled up the inclined plane by vertical effort is

(a) sin θ

(b) cos θ

(c) tan θ

(d) cosec θ

Q20. Internal gears can be made by

(a) hobbing

(b) shaping with pinion cutter

(c) shaping with rack cutter

(d) milling

Q21. Cast iron during machining produces

(a) continuous chips
(b) discontinuous chips
(c) continuous chips with built-up-edge
(d) none of these

Q22. In ideal machines, mechanical advantage is _____ velocity ratio.

(a) equal to

(b) less than

(c) greater than

(d) any of the above

Q23. Gantt chart is used for

(a) inventory control

(b) material handling

(c) production schedule

(d) machine repair schedules

Q24. The value of bulk modulus of a fluid is required to determine

(a) Reynold's number

(b) Froude's number

(c) Mach number

(d) Euler's number

Q25. In one dimensional flow, the flow

(a) is steady and uniform

(b) takes place in straight line

(c) takes place in curve

(d) takes place in one direction

Q26. In second type of levers,

(a) load is in between the fulcrum and effort

(b) effort is in between the fulcrum and load

(c) fulcrum is in between the load and effort

(d) none of these

Q27. In a flange coupling, the flanges are coupled together by means of

(a) bolts and nuts

(b) studs

(c) headless taper bolts

(d) none of these

Q28. A compound pipe of diameter d_1, d_2 and d_3 having lengths l_1, l_2 and l_3 is to be replaced by an equivalent pipe of uniform diameter d and of the same length (l) as that of the compound pipe. The size of the equivalent pipe is given by

(a) $\frac{}{d^2} = \frac{1}{{d_1}^2} + \frac{2}{{d_2}^2} + \frac{3}{{d_3}^2}$

(b) $\frac{}{d^3} = \frac{1}{{d_1}^3} + \frac{2}{{d_2}^3} + \frac{3}{{d_3}^3}$

(c) $\frac{}{d^4} = \frac{1}{{d_1}^4} + \frac{2}{{d_2}^4} + \frac{3}{{d_3}^4}$

(d) $\frac{}{d^5} = \frac{1}{{d_1}^5} + \frac{2}{{d_2}^5} + \frac{3}{{d_3}^5}$

Q29. A systematic job improvement sequence will consist of

(a) motion study

(b) time study

(c) job enrichment

(d) all of these

Q30. Euler's formula holds good only for

(a) short columns

(b) long columns

(c) both short and long columns

(d) weak columns

Q31. The object of caulking in a riveted joint is to make the joint

(a) free from corrosion

(b) stronger in tension

(c) free from stresses

(d) leak-proof

Q32. Refrigeration works on

(a) Otto cycle

(b) Diesel cycle

(c) Carnot cycle

(d) Reverse Carnot cycle

Q33. Compression members always tend to buckle in the direction of the

(a) axis of load

(b) perpendicular to the axis of load

(c) minimum cross section

(d) least radius of gyration

Q34. A thin spherical shell of diameter (d) and thickness (t) is subjected to an internal pressure (p). The stress in the shell material is

(a) pd/t

(b) pd/2t

(c) pd/4t

(d) pd/8t

Q35. In a vibrating system, if the actual damping coefficient is 40 N/m/s and critical damping coefficient is 420 N/m/s, then logarithmic decrement is equal to

(a) 0.2

(b) 0.4

(c) 0.6

(d) 0.8

Q36. For high speed engines, the cam follower should move with

(a) uniform velocity

(b) simple harmonic motion

(c) uniform acceleration and retardation

(d) cycloidal motion

Q37. If ω/ω_n is very high for a body vibrating under steady state vibrations, the phase angle for all values of damping factors, will tend to approach

(a) 0°

(b) 90°

(c) 180°

(d) 360°

Q38. When the relation between the controlling force (F_c) and radius of rotation (r) for a spring controlled governor is $F_c = ar + b$, then the governor will be

(a) stable

(b) unstable

(c) isochronous

(d) none of these

Q39. The maximum or minimum value of the swaying couple is

(a) $\pm c.m.\omega^2 r$

(b) $\pm a(1-c)m\ \omega^2 r$

(c) $\pm \frac{a}{\sqrt{2}}(1-c)m\ \omega^2 r$

(d) $\pm 2a(1-c)m\ \omega^2 r$

Q40. The frictional torque transmitted in a flat pivot bearing with assumption of uniform pressure is _____ as compared to uniform wear.

(a) Less

(b) more

(c) same

(d) any of the above

Q41. A cycle consisting of one constant pressure, one constant volume and two isentropic processes is known as

(a) Carnot cycle

(b) Stirling cycle

(c) Otto cycle

(d) Diesel cycle

Q42. The compressed air may be used

(a) in gas turbine plants

(b) for operating pneumatic drills

(c) in starting and supercharging of I.C. engines

(d) all of the above

Q43. The stagnation pressure rise in a centrifugal compressor takes place

(a) in the diffuser only

(b) in the impeller only

(c) in the diffuser and impeller

(d) in the inlet guide vanes only

Q44. In a jet propulsion

(a) the propulsive matter is ejected from within the propelled body

(b) the propulsive matter is caused to flow around the propelled body

(c) its functioning does not depend upon presence of air

(d) none of the above

Q45. Which of the following statement is wrong?

(a) In a two stage reciprocating air compressor with complete intercooling, maximum work is saved.

(b) The minimum work required for a two stage reciprocating air compressor is double the work required for each stage.

(c) The ratio of the volume of free air delivery per stroke to the swept volume of the piston is called volumetric efficiency.

(d) none of the above

Q46. Intercooling in multi-stage compressors is done

(a) to cool the air during compression

(b) to cool the air at delivery

(c) to enable compression in two stages

(d) to minimise the work of compression

Q47. The ratio of work done per cycle to the stroke volume of the compressor is known as

(a) compressor capacity

(b) compression ratio

(c) compressor efficiency

(d) mean effective pressure

Q48. The accuracy of micrometers, calipers, dial indicators can be checked by a

(a) feeler gauge

(b) slip gauge

(c) ring gauge

(d) plug gauge

Q49. Which resistive component is designed to be temperature sensitive?

(a) thermistor

(b) rheostat

(c) potentiometer

(d) photoconductive cell

Q50. In oblique projection, important shapes should be in this position relative to the viewing plane:

(a) parallel

(b) perpendicular

(c) adjacent

(d) rotated