Hall Ticket Number:

Code No. : 21717

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

M.E. (EEE: CBCS) I-Semester Main Examinations, January-2019

(Power Systems & Power Electronics)

Power Quality Engineering

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q.No.	Stem of the question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	Distinguish between spectrum analyzer and harmonic analyzer.	2	1	1	1,2
2.	How is flicker caused?	2	1	1	1,4
3.	How is critical distance to fault evaluated for a given magnitude of sag?	2	2	2	2,4
4.	What is the effect of transformer on sag magnitude?	2	3	3	4
5.	What are the various circuits that can be implemented for ac to dc conversion in various power electronic equipment?	2	3	3	3
6.	Explain why DC link capacitor is used in an AC drive.	2	2	3	3
7.	What are the problems experienced by communication systems due to harmonics in power systems?	2	3	3	1,2
8.	How do non linear loads affect power quality?	2	4	2	2,4
9.	What are the merits and demerits of ungrounded systems?	2	2	2	4
10.	What is resistance grounding and why is it used?	2	2	1	3
	Part-B (5 × 8 = 40 Marks)				
11. a)	Discuss how power interruption can be considered to be a power quality issue.	4	4	2	3
b)	What are the effects of harmonics on motors?	4	5	3	2
12. a)	Explain why high impedance faults cause large negative phase angle jumps?	4	4	3	2
b)	Explain behavior of induction motor during sag.	4	2	3	4
13. a)	Derive an expression for drop in speed of an AC drive during brief sag in voltage.	4	2	2	1,2
b)	Explain the effect of phase angle jump on the performance of DC drive	4	5	1	4
14. a)	Distinguish between harmonics and transients	4	2	1	2
b)	How do single phase power supplies contribute to harmonics?	4	3	1	3
15. a)	Distinguish between grounding and bonding.	4	3	1	3
b)	What are the various reasons for grounding?	4	3	3	4
16. a)	What are interharmonics and how they are caused?	4	2	2	1
b)	What are various issues of power quality?	4	2	1	2

Contd... 2

Code No. : 21717

17. Answer any ***two*** of the following:				
a) Derive an expression time to trip of a Variable Frequency Drive (VFD) during voltage sag conditions. How is it affected by under voltage setting of VFD?	4	2	3	3
b) What are triplen harmonics and how are they eliminated?	4	2	3	4
c) How do nonlinear loads affect power quality?	4	2	2	1,2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60%
2	Knowledge on application and analysis (Level-3 & 4)	30%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	10%

Code No. : 21917

14. a)	Explain the X.509 v3 certificate structure.	4	4	2	1
b)	Explain various advantages and disadvantages of a Network-Based IDPS (NIPDS).	4	4	2	1,2
15. a)	What is the importance of Secure Electronic Transaction? What are its key features? Explain the SET participants using a diagram.	4	5	2	1
b)	Examine the role of negative feedback loop in ensuring the periodic measurement of project management.	4	5	2	1,2
16. a)	Discuss the risk control strategies.	4	1	2	1
b)	Users A and B use Diffie Hellman key exchange technique with a common prime P=17 to establish a shared secret over an insecure channel. If user A has a private key X_a=4, user B has a private key X_b=5, calculate the secret key used for encryption	4	2	3	1,2
17.	Answer any ***two*** of the following:				
a)	Discuss the Authentication Header (AH) protocol used in IPSec.	4	3	2	1
b)	How smart cards help in providing security? Examine five areas of smart card application.	4	4	2	1,2
c)	Explain .Secure socket layer protocol for web security.	4	5	2	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	58%
2	Knowledge on application and analysis (Level-3 & 4)	42%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	--

Hall Ticket Number:

Code No. : 21817

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

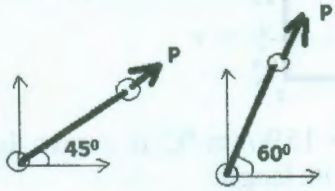
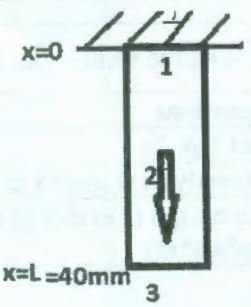
M.E. (Mech. Engg.: CBCS) I-Semester Main Examinations, January-2019

(Advanced Design & Manufacturing)

Finite Element Techniques

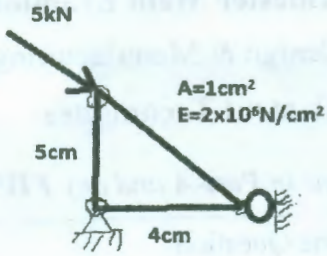
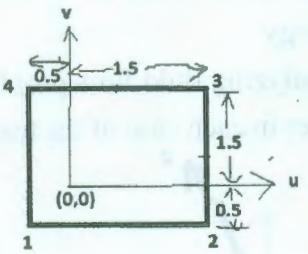
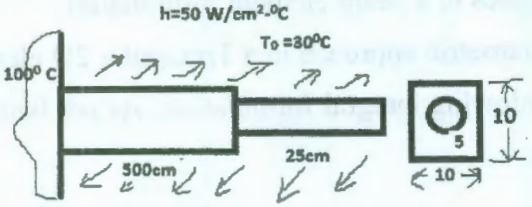
Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q. No	Stem of the Question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	State principle of Minimum Potential Energy.	2	1	1	1
2.	Discuss the application of the FEM for analyzing fluid flow problem.	2	2	1	2
3.	Compare the maximum value of the stresses in each case of the truss element shown below: 	2	3	2	3
4.	Explain the variation of bending stresses in a beam element formulation.	2	2	2	3
5.	Explain briefly the concept of Isoparametric approach in a Triangular 2D element.	2	2	2	3
6.	Find u, u_1, u_2, W_1 and W_2 for the following integral formulation. As per two point numerical integration. $$\int_a^b f(x)dx = \int_{-1}^{1} f(u)du = W_1 f(u_1) + W_2 f(u_2)$$	2	4	3	5
7.	Develop various boundary conditions to be imposed on a triangular plate under 2D steady state heat transfer.	2	2	3	5
8.	The Eigen values of a dynamic system are 64 and 108. Find its fundamental frequency in Hz.	2	4	3	5
9.	Calculate the stiffness matrix for a Shaft of $d = 20\ mm,\ L = 60\ mm, G = 80 \times 10^3\ N/mm^2$.	2	3	3	3
10.	In plate bending, elaborate minimum degrees of freedom to be considered at each node.	2	1	4	10
	Part-B (5 × 8 = 40 Marks)				
11.	Compute Stresses in axial bar with linear load shown below: Take E = 180 GPa, A = 100mm^2.  consider the load as 2 KN at node 2 which is a mid-node	8	3	2	3

Contd...2

Code No.: 21817

12. Compute stresses in each link of Three member truss structure shown below: 	8	4	2	5
13. Deduce shape functions for the following quadrilateral element: Node numbers: 1, 2, 3 and 4. 	8	2	3	5
14. A metallic fin of thermal conductivity K = 15W/cm-^{0}C is shown in the figure. Compute the temperature distribution across its length. 	8	6	3	5
15. Elaborate the FEM approach to determine 3D Stresses in an elastic body.	8	1	5	10
16. a) Derive basic relations between strain and displacements.	4	2	1	1
b) Why frame element analysis is equivalent to the combination of truss element and beam element.	4	4	2	3
17. Answer any ***two*** of the following:				
a) List point wise various assumptions needed for finite element formulation of Axisymmetric models.	4	2	3	3
b) Sketch the mode shapes against three nodded axial bar having frequencies: 0, 12 rad/s and 28 rad/s and corresponding amplitude ratios: [1.2 2.6], [0.5 -1.6] and [1 -1]	4	5	4	5
c) Write basic sequence steps used in commercial ANSYS software.	4	2	5	2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	50%
2	Knowledge on application and analysis (Level-3 & 4)	35%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	15%

Code No. : 21517

16. a)	Analyze and compare various adaptive filters.	4	2	5	1
b)	Suggest a suitable value for the step size parameter μ that would ensure convergence of the method of steepest descent based on the given value for matrix R. $\begin{bmatrix} 1 & 0.5 \\ 0.5 & 1 \end{bmatrix}$, $P = \begin{bmatrix} 0.5 \\ -0.25 \end{bmatrix}$ Based on the correlation matrices compute $w_1(n)$ & $w_2(n)$.	4	3	4	3
17.	Answer any ***two*** of the following:				
a)	Using the block diagram of Kalman filter, explain the importance of one step predictor and Kalman gain.	4	1	3	1
b)	Write in detail computational complexities involved in extended Kalman filters.	4	3	3	1
c)	State various steps involved in the Vector Kalman filtering.	4	2	3	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	61.25
2	Knowledge on application and analysis (Level-3 & 4)	38.75
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	-

16. a) Explain about interconnect delay modeling.	5	2	5	3
b) What are the circuit parameters which can be extracted from layout and give their effects.	3	2	5	1
17. Answer any ***two*** of the following:				
a) Parasitics in VLSI layouts	4	2	5	1
b) Scalable CMOS design rules	4	2	4	2
c) Scope and applications of VLSI physical design.	4	1	1	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60.0
2	Knowledge on application and analysis (Level-3 & 4)	34.0
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	6.0

Hall Ticket Number:

Code No. : 21815

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

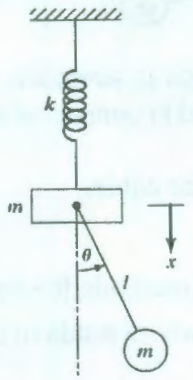
M.E. (Mech. Engg.: CBCS) I-Semester Main Examinations, January-2019

(Advanced Design & Manufacturing)

Mechanical Vibrations

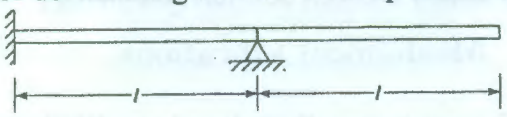
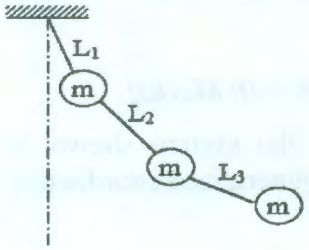
Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q. No	Stem of the Question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	What is a mode shape? How is it computed?	2	3	1	2,6
2.	What is a rigid body mode? How is it determined?	2	1	1	2,6
3.	Interpret the effect of a tensile force on the natural frequencies of a beam.	2	2	1	2,6
4.	How does a continuous system differ from a discrete system in the nature of its equation of motion?	2	4	1	2,6
5.	What is a frequency response function?	2	1	2	2,6
6.	Contrast circle fitting from curve fitting.	2	3	2	2,6
7.	Explain the function of a vibration isolator.	2	4	4	2,6
8.	What is the purpose of experimental modal analysis?	2	5	4	2,6
9.	Describe spectral density.	2	1	3	2,6
10.	What is an impulse response function?	2	1	5	2,6
	Part-B (5 × 8 = 40 Marks)				
11. a)	Develop the equations of motion of the system shown in Fig. by using Lagrange's equations with x and Θ as generalized coordinates. 	4	5	1	2,6
b)	The mass and stiffness matrices of an airplane in flight, with a three-degree-of-freedom model for vertical motion are given by $[m] = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ *and* $[k] = \begin{bmatrix} 3 & -3 & 0 \\ -3 & 6 & -3 \\ 0 & -3 & 3 \end{bmatrix}$ Determine the highest natural frequency of vibration of the airplane using the matrix iteration method.	4	6	2	2,6

Contd... 2

Code No. : 21815

12. a)	A uniform beam of length 2l is fixed at the left end, supported on a simple support at the middle, and free at the right end as shown in Fig. Derive the frequency equation for determining the natural frequencies of vibration of the continuous beam. 	4	4	2	2,6
b)	Calculate the natural of frequencies of Torsional vibration for a shaft fixed at both ends.	4	5	2	2,6
13. a)	For a single degree of freedom system, explain peak amplitude method.	4	3	3	2,6
b)	Summarize the procedure of multi curve fitting in time domain for multi degree of freedom system.	4	3	3	2,6
14. a)	What is vibration exciter? Outline the Electro-dynamic shaker with neat sketch.	4	4	4	2,6
b)	A steel shaft of diameter 2.5 cm and length 1 m is supported at the two ends in bearings. It carries a turbine disc, of mass 20 kg and eccentricity 0.005 m, at the middle and operates at 6000 rpm. The damping in the system is equivalent to viscous damping with $\zeta = 0.01$. Determine the whirl amplitude of the disc at (i) operating speed, (ii) critical speed, and (iii) 1.5 times the critical speed.	4	6	4	2,6
15. a)	Explain about stationary, random and variable processes.	4	3	3	2,6
b)	What is Chaotic Behavior of Duffing's equation with the forcing Term?	4	2	5	2,6
16. a)	Determine the influence coefficients for the triple pendulum shown in Fig. 	4	6	1	2,6
b)	A cable of length l and mass ρ per unit length is stretched under a tension P. One end of the cable is fixed and the other end is connected to a pin, which can move in a frictionless slot. Find the natural frequencies of vibration of the cable.	4	6	1	2,6
17.	Answer any ***two*** of the following:				
a)	Explain any two modal parameter extraction methods for non-linear systems.	4	3	3	2,6
b)	What is condition monitoring? Explain any two methods to diagnose the faults of machines.	4	2	4	2,6
c)	Find the autocorrelation function of a random process whose power spectral density is $S(\omega) = S_0$ is constant between the frequencies ω_1 and ω_2.	4	6	3	2,6

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	55
2	Knowledge on application and analysis (Level-3 & 4)	35
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	10

Hall Ticket Number:

Code No.: 21515

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

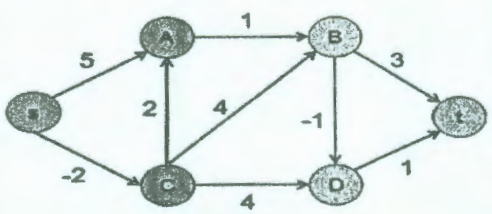
M.E. (ECE: CBCS) I-Semester Main Examinations, January-2019

(Communication Engineering & Signal Processing)

Data and Computer Communication Networks

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q. No	Stem of the Question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	Differentiate between 1- Persistent and P-Persistent techniques.	2	2	2	1
2.	For an FDM multiplexed system, find the minimum bandwidth for the path with five lines each requiring 4000Hz.	2	3	2	3
3.	How piggy backing is used in HDLC protocol?	2	3	3	1
4.	A telephone line has bandwidth of 3000Hz and the signal to noise ratio is 3162. Calculate the channel capacity.	2	1	1	3
5.	Why is adaptive routing protocol preferred over other fixed routing protocols?	2	1	3	2
6.	Compare Datagram and Virtual circuit switching in networks.	2	2	2	1
7.	Define point coordination function and distributed coordination function as related to IEEE 802.11.	2	1	4	1
8.	State the requirements in choosing a topology for a network.	2	4	4	1
9.	Can you deploy a LAN without IP address? If so, how are the nodes identified and communicated in LAN?	2	3	5	3
10.	How does an user to network interface differ from a network to network interface in ATM?	2	1	5	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	Identify the key components of any data network and explain them briefly.	3	2	1	1
b)	Discuss various TCP/IP addressing concepts and also give examples for classful and classless addressing.	5	2	1	3
12. a)	Discuss the architecture and Layers of SONET and calculate the signal rate of STS-1 frame assuming standard specifications.	4	2	2	1
b)	Design a cyclic encoder and decoder for (7, 4) cyclic code for messages 1011, 0101.	4	4	2	3
13. a)	Determine the least cost path using Bellman Ford algorithm for the following network. 	4	4	3	3
b)	Compare in channel signaling and common channel signaling methods.	4	2	3	1

Contd...2

Code No.: 21515

14. a)	Give the differences between a bridge, two layered switch and a three layer switch.	4	4	4	1
b)	Explain the spanning tree approach in networks with the help of an example.	4	3	4	3
15. a)	Discuss the role of firewalls in the security of internet.	4	4	5	1
b)	Compare and contrast IPV4, IPV6 and give reasons for moving from IPv4 to IPv6?	4	1	5	2
16. a)	Compare ISO-OSI and TCP/.IP models.	4	3	1	1
b)	A network with one primary and four secondary stations uses polling. The size of data frame is 1000 bytes. The size of Poll, ACK and NAK are of 32 bytes each. Each Station has 5 frames to send. How many total bytes are exchanged? Assume that there is no limitation on number of frames, a station can send in response to a poll.	4	2	3	3
17.	Answer any ***two*** of the following:				
a)	Write notes on X.25 protocol.	4	2	2	1
b)	Draw the structure of MAC frame format and describe different fields in the frame.	4	2	4	1
c)	Illustrate the role of H.323 protocol in VoIP communication.	4	4	5	2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	57.5
2	Knowledge on application and analysis (Level-3 & 4)	42.5
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	---

Hall Ticket Number:

Code No.: 21715

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

M.E. (EEE: CBCS) I-Semester Main Examinations, January-2019

(Power Systems & Power Electronics)

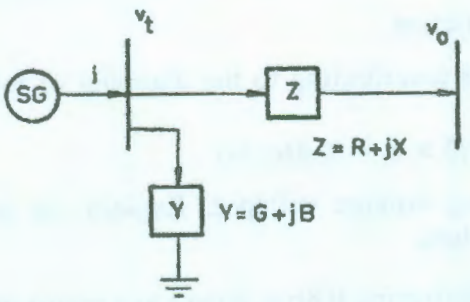
Power System Stability

Time: 3 hours Max. Marks: 60

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q. No	Stem of the Question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	What is meant by steady state stability limit?	2	1	1	1,2
2.	Can power be transferred if the reactance of transmission line is zero? Justify the statement.	2	5	3	1,2
3.	Why does equal area criterion give only absolute stability of power system?	2	1	1	1,2
4.	List any two methods to improve the transient stability of a power system.	2	4	1	1,2
5.	What is the role of governor in hydraulic turbine?	2	1	1	1,2
6.	Draw the block diagram of tandem-compound single-reheat steam turbines.	2	2	1	1,2
7.	Write the necessity of supplementary damping system in a large power system.	2	1	3	1,2
8.	What is the role of supplementary excitation circuit in the operation of power system?	2	1	3	1,2
9.	Define torsional stiffness coefficient.	2	1	1	1,2
10.	What are the different sources contributing to the damping of torsional oscillations?	2	1	2	1,2
	Part-B (5 × 8 = 40 Marks)				
11. a)	What are the factors affecting voltage collapse. Explain the voltage stability relation with these factors.	4	2	2	1,2,3
b)	A generator rated 75 MVA is delivering 0.8p.u. power to a motor through a transmission line of reactance j 0.2 p.u. The terminal voltage of the generator is 1.0 p.u. and that of the motor is also 1.p.u. Determine the generator emf behind transient reactance. Find also the maximum power that can be transferred.	4	4	1	1,2,3
12. a)	Explain point-by-point method of solving swing equation.	4	2	2	1,2,3
b)	A 20MVA, 50 Hz generator delivers 18MW over a double circuit line to an infinite bus. The generator has K.E. of 3.0 MJ/MVA at rated speed. The generator transient reactance is $X_d' = 0.35$ p.u. Each transmission circuit has a reactance of 0.2p.u. on a 20MVA base. $\lvert E' \rvert = 1.1$ p.u. and infinite bus voltage is $V = 1.0\angle 0^0$. A three phase fault (short circuit) occurs at the mid-point of one of the transmission lines. Plot swing curve with fault cleared by simultaneous opening of breakers at both ends of the line at 6.25 cycles after occurance of fault.	4	4	1	1,2,3

Contd...2

13. a)	Derive transfer function of all the components of the Hovey's hydraulic power and governor system.	4	2	1	1,2
b)	Obtain the potential energy function for UPFC.	4	3	3	1,2
14. a)	Draw the transfer function block diagram for low-frequency oscillation studies based on a one-machine, infinite bus power system model with a local load. Write the relevant equations.	5	2	1	1,2
b)	Design the supplementary excitation block diagram for single machine infinite bus.	3	2	2	1,2,3
15. a)	Discuss about various problems associated to sub-synchronous torsional oscillations in detail.	5	6	2	1,2,3
b)	Write the shaft system equations for sub synchronous oscillation studies.	3	6	2	1,2,3
16. a)	Differentiate between steady state stability and transient state stability of power systems. Discuss the factors that affect the above stability.	4	4	2	1,2,3
b)	What is 'Equal Area Criterion'? How is it derived from the swing equation? Explain the operation of a synchronous motor using this criterion when sudden increase in mechanical load on that motor occurs.	4	1	1	1,2,3
17.	Answer any ***two*** of the following:				
a)	Draw and explain the hydraulic governors – electrical model for steam turbines.	4	2	1	1,2
b)	Find the initial steady-state value of the d and q component currents, voltages and the torque angle of the one-machine, infinite-bus system as shown in the figure below for given P_{eo}, $\lvert v_{to} \rvert$ and $\lvert v_{o} \rvert$ 	4	2	1	1,2,3
c)	List different methods for counteracting Sub Synchronous Resonance problems.	4	4	3	1,2,3

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60.0
2	Knowledge on application and analysis (Level-3 & 4)	27.5
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	12.5

Hall Ticket Number:

Code No. : 21915

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

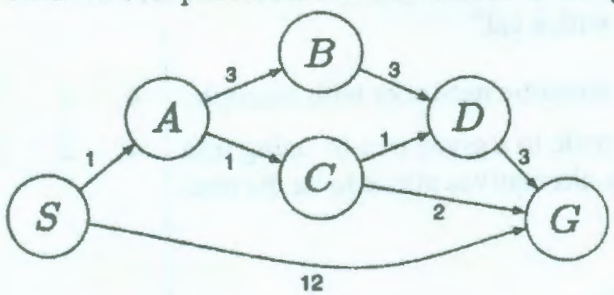
M.Tech. (CSE: CBCS) I-Semester Main Examinations, January-2019

Artificial Intelligence

Time: **3** hours Max. Marks: **60**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q.No.	Stem of the question	M	L	CO	PO
	Part-A (10 × 2 = 20 Marks)				
1.	Define AI and write its applications.	2	2	1	1
2.	Given a search tree with uniform branching factor of 4. Calculate the maximum number of nodes expanded by a breadth first search for a goal node at depth 5.	2	3	1	1
3.	Draw the frame structure for the vehicle 'CAR'	2	3	2	2
4.	Convert the following into clausal form (PVQ)->R	2	2	2	1
5.	Write the operators used in planning.	2	2	3	1
6.	Given: A and B are Boolean random variables. P(A=True)=0.3,P(A=False)=0.7,P(B=True|A=True)=0.4, P(B=False|A=True)=0.6,P(B=True|A=False)=0.6,P(B=False|A=False)=0.4. Calculate P(A=True|B=False)	2	3	3	1
7.	How attributes are selected while constructing the decision tree when set of examples are given?	2	2	4	1
8.	Draw the neural network for implementing two input Boolean OR operation.	2	3	4	2
9.	Differentiate the crisp set from fuzzy set with example.	2	2	5	1
10.	Specify the different speech acts with examples.	2	2	5	1
	Part-B (5 × 8 = 40 Marks)				
11. a)	Explain the Hill climbing algorithm and give solution for its drawback .	4	2	1	1
b)	Find the best path from Node S to node G using the Given Heuristic function.	4	3	1	2



State	h1	h2
S	4	3
A	2	2
B	6	5
C	2	1
D	3	2
G	0	0

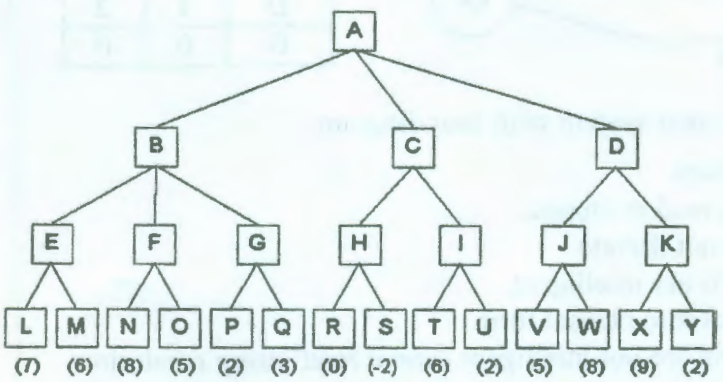
12. a)	Explain the rule based expert system with neat diagram.	4	2	2	1
b)	Assume the following facts 1. Whoever can read is literate. 2. Dolphins are not literate. 3. Some dolphins are intelligent. i) Convert the sentences into clausal form ii) Prove that 'Some who are not intelligent cannot read' using resolution refutation method.	4	3	2	2

Contd... 2

13. a)	What is Sussaman anamoly? Explain with example.	4	2	3	1
b)	We want to design a troubleshooting advisor for PCs. Let CF be a Boolean random variable representing whether the computer fails or not. Assume there are two possible causes of failure: Electricity-failure and Malfunction-of-computer, represented using the Boolean random variables EF and MC, respectively. Let P(EF) = 0.1, P(MC) = 0.2, P(CF | ~EF, ~MC) = 0.0, P(CF | ~EF, MC) = 0.5, P(CF | EF, ~MC)= 1.0, and P(CF | EF, MC) = 1.0. Draw the Bayesian Network (with conditional probability table) for this problem and compute P(EF | CF).	4	3	3	2
14. a)	Explain multilayer feed-forward neural network with neat diagram.	4	2	4	1
b)	Find the proposition rules which can be learnt from the following examples.	4	3	4	2

Size	Colour	Shape	Weight	Expensive
Big	Red	Square	Heavy	Yes
Small	Blue	Triangle	Light	Yes
Small	Blue	Square	Light	No
Big	Green	Triangle	Heavy	No
Big	Blue	Square	Light	No
Big	Green	Square	Heavy	Yes
Small	Red	Triangle	Light	Yes

15. a)	Explain the Sugeno fuzzy inferencing.	4	2	5	1
b)	Write the grammar and draw parse tree to parse the following sentence "The beautiful girl saw a man in the park with a cat"	4	2	5	2
16. a)	Explain the knowledge representation using semantic networks with example.	4	2	1	1
b)	Calculate the Backed-up values for the each node to a given tree by using min max procedure.Consider A starts as max node alternatives min is to be the next node.	4	2	2	2



Contd... 3

17. Answer any ***two*** of the following:				
a) State and prove the Bayes' theorem.	4	2	3	1
b) Consider a Perceptron with 3 inputs and one output unit that uses a linear threshold activation function with threshold 0.7, and initial weights w1 = 0.3, W2 = 0.6, W3 = 0.8.	4	2	4	2
i) What is the output of the Perceptron given the inputs I1 = 1, I2 = 0, I3 = 1?				
ii) What are the weights values after applying the Perceptron learning rule with the above input and desired output 0 (learning rate (η) = 0.2)?				
c) Write about the ambiguities that may arise in natural language processing.	4	2	5	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	60%
2	Knowledge on application and analysis (Level-3 & 4)	40%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	--