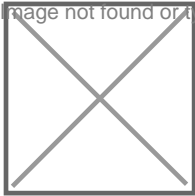


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## PhD ENTRANCE EXAM RESULT , VMSBUTU

Answer Key for Electrical Engineering Branch

Question	Options
1 : A statement of the quantitative research question should:	1) Extend the statement of purpose by specifying exactly the question (the researcher will address) 2) Help the research in selecting appropriate participants, research methods, measures, and materials 3) Specify the variables of interest <b>4) All the above</b>
2 : In the process of conducting research 'Formulation of Hypothesis" is followed by	1) Statement of Objectives 2) Analysis of Data <b>3) Selection of Research Tools</b> 4) Collection of Data
3 : In order to pursue the research, which of the following is priority required?	1) Developing a research design <b>2) Formulating a research question</b> 3) Deciding about the data analysis procedure 4) Formulating a research hypothesis

Question	Options
<p>4 : What are the core elements of a Research Process?</p>	<p>1) Introduction; Data Collection; Data Analysis; Conclusions and Recommendations  2) Executive Summary; Literature Review; Data Gathered; Conclusions, Bibliography  3) Research Plan; Research Data; Analysis; References  <b>4) Introduction; Literature Review; Research Methodology; Results; Discussions and Conclusions</b></p>
<p>5 : What does the term 'longitudinal design' mean?</p>	<p>1) A study completed far away from where the researcher lives  2) A study which is very long to read.  3) A study with two contrasting cases.  <b>4) A study completed over a distinct period of time to map changes in social phenomena</b></p>
<p>6 : Which institution approved the '6G Vision Framework'</p>	<p>1) NASSCOM  2) NITI Aayog  <b>3) ITU</b>  4) IMF</p>
<p>7 : Which company has launched ChatGPT rival Bard in European Union, Brazil and other nations?</p>	<p><b>1) Google</b>  2) Microsoft  3) Apple  4) Infosys</p>
<p>8 : What is AIRAWAT ?</p>	<p>1) Submarine  <b>2) AI supercomputer</b>  3) 5G-enabled drone  4) Recently discovered exoplanet</p>

Question	Options
9 : The Union Government has exempted which institution from the purview of the Right to Information Act, 2005?	1) RBI 2) SEBI <b>3) CERT-In</b> 4) Election Commission of India
10 : What is 'PSiFI system'	1) A primary method of waste disposal <b>2) A system for recognizing human emotions</b> 3) A wearable device for monitoring blood pressure 4) A voice recognition AI tool
11 : In a mixture of 60 litres, the ratio of milk to water is 2 : 1. If this ratio is to be 1 : 2, then the quantity of water (in litres) to be further added is ?	1) 20 2) 30 3) 40 <b>4) 60</b>
12 : The cost of Type 1 rice is Rs. 15 per kg and Type 2 rice is Rs.20 per kg. If both Type 1 and Type 2 are mixed in the ratio of 2 : 3, then the price per kg of the mixed variety of rice is ?	1) 19.5 2) 19 <b>3) 18</b> 4) 18.5
13 : A cistern is normally filled in 8 hours but takes two hours longer to fill because of a leak in its bottom. If the cistern is full, the leak will empty it in ?	<b>1) 20</b> 2) 28 3) 36 4) 40
14 : A starts business with Rs. 3500 and after 5 months, B joins with A as his partner. After a year, the profit is divided in the ratio 2 : 3. What is B's contribution in the capital ?	1) 8000 2) 8500 <b>3) 9000</b> 4) 7500
15 : A tank is 25 m long, 12 m wide and 6 m deep. The cost of plastering its walls and bottom at 75 paise per sq. m, is ?	1) 456 2) 458 <b>3) 558</b> 4) 568

Question	Options
<p>16 : If MADE is coded as 12236 and BAD is coded as 123, then how will DECK be coded as ?</p>	<p>1) <b>36212</b>  2) 34312  3) 36201  4) 44412</p>
<p>17 : Five balls L1, L2, L3, L4 and L5 are kept one above the other (not necessarily in the same order). L1 is just above L5 and just below L4. L2 is just above L3 and just below L5. How many balls are above L2 ?</p>	<p>1) 2  2) <b>3</b>  3) 4  4) 4</p>
<p>18 : Mayank is the son of Chhaya. Chhaya and Deepa are sisters. Gayatri is the mother of Deepa. If Naman is the son of Gayatri , How is Mayank related to Naman ?</p>	<p>1) <b>Nephew</b>  2) Brother  3) Father  4) Son</p>
<p>19 : Which number will replace the question mark(?) in the following series? 98, 95, 86, 82, 66, ?, 36 ?</p>	<p>1) 58  2) 60  3) <b>61</b>  4) 63</p>
<p>20 : If 5 November 2019 was Tuesday, then what was the day of the week on 5 December 2011 ?</p>	<p>1) Tuesday  2) <b>Monday</b>  3) Sunday  4) Saturday</p>
<p>21 : A 10 pole, 50 Hz, 240 V, single phase induction motor runs at 540 RPM while driving rated load. The frequency of induced rotor currents due to the backward field is:</p>	<p>1) 100 Hz  2) <b>95 Hz</b>  3) 10 Hz  4) 5 Hz</p>
<p>22 : A continuous-time system that is initially at rest is described by <math>dy(t)/dt + 3y(t) = 2x(t)</math>, where <math>x(t)</math> is the input voltage and <math>y(t)</math> is the output voltage. The impulse response of the system is:</p>	<p>1) <math>3e^{-2t}</math>  2) <math>(1/3) e^{-2t} u(t)</math>  3) <b><math>2e^{-3t}</math></b>  4) <math>2e^{-2t}</math></p>

Question	Options
<p>23 : Which of the following statements is true about the two sided Laplace transform?</p>	<p>1) It exists for every signal that may or may not have a Fourier Transform.</p> <p><b>2) It has no poles for any bounded signal that is non-zero only inside a finite time interval.</b></p> <p>3) If a signal can be expressed as a weighted sum of shifted one sided exponentials, then its Laplace transform will have no poles.</p> <p>4) The number of finite poles and finite zeroes must be equal.</p>
<p>24 : A single 50 Hz synchronous generator on droop control was delivering 100 MW power to a system. Due to increase in load, generator power had to be increased by 10 MW, as a result of which, system frequency dropped to 49.75 Hz. Further increase in MW, as a result of which, system frequency dropped to 49.75 Hz. Further increase in MW supplied by the generator is_____ (rounded off to two decimal places).</p>	<p>1) 80 MW</p> <p>2) 50 MW</p> <p><b>3) 130MW</b></p> <p>4) 180MW</p>
<p>25 : A lossless transmission line with 0.2 pu reactance per phase uniformly distributed along the length of the line, connecting a generator bus to a load bus. A distance relay placed at the generator bus protects up to 80 % of its length. The generator terminal voltage is 1 pu. There is no generation at the load bus. The threshold pu current for operation of the distance relay for a solid three phase-to-ground fault on the transmission line is closest to:</p>	<p>1) 3.61</p> <p>2) 1</p> <p><b>3) 6.25</b></p> <p>4) 5</p>
<p>26 : A three-phase,50 Hz, 4- pole induction motor runs at no-load with a slip of 1%. With full load, the slip increases to 5%. The % speed regulation of the motor (rounded off to two decimal places) is _____.</p>	<p>1) 0.022</p> <p>2) 0.015</p> <p>3) 0.0315</p> <p><b>4) 0.0421</b></p>

Question	Options
<p>27 : A single-phase, 4 kVA, 200 V/100 V, 50 Hz transformer with laminated CRGO steel core has rated no-load loss of 450 W. When the high-voltage winding is excited with 160 V, 40 Hz sinusoidal ac supply, the no-load losses are found to be 320 W. When the high-voltage winding of the same transformer is supplied from a 100 V, 25 Hz sinusoidal AC source, the no-load losses will be _____ W (rounded off to 2 decimal places).</p>	<p>1) 100 2) 125 <b>3) 162</b> 4) 195</p>
<p>28 : Out of the following options, the most relevant information needed to specify the real power (P) at the PV buses in a load flow analysis is.</p>	<p>1) base power of the generator <b>2) solution of economic load dispatch.</b> 3) rated power output of the generator 4) rated voltage of the generator.</p>
<p>29 : 1. For a given vector <math>W = [1, 2, 3]^T</math>, the vector normal to the plane defined by <math>W^T x = 1</math> is</p>	<p>1) <math>[-2, -2, 2]^T</math> 2) <math>[3, 0, -1]^T</math> 3) <math>[3, 2, 1]^T</math> <b>4) <math>[1, 2, 3]^T</math></b></p>
<p>30 : The following columns present various modes of induction machine operation and the ranges of slip. The correct matching between the elements in column A with those of column B is</p>	<p><b>1) a-r, b-p and c-q</b> 2) a-r, b-q and c-p 3) a-p, b-r and c-q 4) a-q, b-p and c-r</p>
<p>31 : 11. A step-up chopper is used to feed a load at 400 V dc from a 250 V dc source. The inductor current is continuous. If the 'off' time of the switch is 20<math>\mu</math>s, the switching frequency of the chopper in kHz is _____.</p>	<p>1) 25 <b>2) 31</b> 3) 20 4) 40</p>
<p>32 : 12. The most commonly used relay, for the protection of an alternator against loss of excitation, is:</p>	<p>1) differential relay <b>2) offset Mho relay</b> 3) Buchholz relay 4) over current relay</p>

Question	Options
<p>33 : A balanced Wheatstone bridge ABCD has the following arm resistances: <math>R_{AB} = 1k\Omega \pm 2.1\%</math>; <math>R_{BC} = 100\Omega \pm 0.5\%</math>; RCD is an unknown resistance; <math>R_{DA} = 300\Omega \pm 0.4\%</math>. The value of RCD and its accuracy is</p>	<p>1) <math>3000\Omega \pm 90\%</math>  2) <math>3000\Omega \pm 3\%</math>  <b>3) <math>30\Omega \pm 0.9\%</math></b>  4) <math>30\Omega \pm 3\%</math></p>
<p>34 : 14. The open loop transfer function of a unity gain negative feedback system is given by, <math>G(s)=K/(S^2+4S-5)</math> ; The range of K for which the system is stable is</p>	<p><b>1) <math>K &gt; 5</math></b>  2) <math>K &lt; 5</math>  3) <math>K &lt; 3</math>  4) <math>K &gt; 3</math></p>
<p>35 : A charger supplies 100 W at 20 V for charging the battery of a laptop. The power devices, used in the converter inside the charger, operate at a switching frequency of 200 kHz. Which power device is best suited for this purpose?</p>	<p>1) Thyristor  <b>2) MOSFET</b>  3) BJT  4) IGBT</p>
<p>36 : The type of single-phase induction motor, expected to have the maximum power factor during steady-state running conditions, is</p>	<p>1) capacitor start  2) split phase (resistance start)  <b>3) capacitor start, capacitor run</b>  4) shaded pole</p>
<p>37 : A MOD 2 and a MOD 5 up-counter when cascaded together results in a MOD _____ counter.</p>	<p>1) 5  2) 7  <b>3) 10</b>  4) 2</p>
<p>38 : An inductor having a Q-factor of 60 is connected in series with a capacitor having a Q-factor of 240. The overall Q-factor of the circuit is _____. (rounded off to nearest integer)</p>	<p>1) 35  2) 28  3) 58  <b>4) 48</b></p>
<p>39 : The resonant frequency of network is 150 kHz and a bandwidth of 600 Hz. The Q-factor of the network is _____.</p>	<p><b>1) 250</b>  2) 200  3) 450  4) 300</p>

Question	Options
40 : The maximum clock frequency in MHz of a 4-stage ripple counter, utilizing flip-flops, with each flip-flop having a propagation delay of 20 ns, is _____.	<p>1) <b>12.5</b></p> <p>2) 15</p> <p>3) 10</p> <p>4) 17.5</p>
41 : The frequencies of the stator and rotor currents flowing in a three-phase, 8-pole induction motor are 40 Hz and 1 Hz, respectively. The motor speed, in rpm, is _____.	<p>1) 525</p> <p>2) <b>585</b></p> <p>3) 475</p> <p>4) 670</p>
42 : For the closed-loop system shown, the transfer function $E(s)/R(s)$ :	<p>1) <math>G/(1+GH)</math></p> <p>2) <math>GH/(1+GH)</math></p> <p>3) <b><math>1/(1+GH)</math></b></p> <p>4) <math>1/(1+G)</math></p>
43 : A DC shunt generator supplies a load of 7.5 kW at 200 V. If the armature resistance is 0.6 $\Omega$ and field resistance is 80 $\Omega$ , the induced EMF will be:	<p>1) <b>224 V</b></p> <p>2) 218 V</p> <p>3) 212 V</p> <p>4) 204 V</p>
44 : The Thevenin's equivalent voltage, $V_{TH}$ , in V (rounded off to 2 decimal places) of the network shown below, is _____ .	<p>1) <b>14</b></p> <p>2) 15</p> <p>3) 16</p> <p>4) 17</p>
45 : The power in a 3-phase circuit is measured with the help of 2-wattmeters; the readings of one of the wattmeter are positive and that of the other is negative. The magnitude of readings is different. It can be concluded that the power factor of the circuit will be	<p>1) Unity</p> <p>2) Zero</p> <p>3) 0.5</p> <p>4) <b>Less than 0.5</b></p>
46 : The eigenvalues of the matrix as given below are	<p>1) 5 and 2</p> <p>2) 1 and 4</p> <p>3) <b>1 and 6</b></p> <p>4) 7 and 5</p>
47 : A single-phase, full-bridge diode rectifier fed from a 230 V, 50 Hz sinusoidal source supplies a series combination of finite resistance, R, and a very large inductance, L, the two most dominant frequency components in the source current are:	<p>1) 150 Hz, 250 Hz</p> <p>2) <b>50 Hz, 150 Hz</b></p> <p>3) 50 Hz, 100 Hz</p> <p>4) 50 Hz, 0 Hz</p>



Question	Options
<p>48 : In a battery-operated car, the battery voltage is 144 V. It employs a DC motor with an armature resistance of 1.0 ohm through step-up dc chopper. During regenerative braking, when car is moving down hill at some speed its back-emf is 80 V and braking motor current is 20A. Calculate the duty ratio</p>	<p>1) 0.45 2) 0.61 <b>3) 0.58</b> 4) 0.7</p>
<p>49 : In single-pulse modulation of PWM inverters, the third harmonic can be eliminated if the pulse width is equal to</p>	<p>1) 30o 2) 60o 3) 90o <b>4) 120o</b></p>
<p>50 : In a 3-phase bridge inverter, the line-to-line voltage waveform is (1) Square wave for 1800 mode (2) Square wave for 1200 mode (3) Stepped wave for 1800 mode (4) Stepped wave for 1200 mode; From these, the correct statements are</p>	<p>1) 1,3 2) 2,3 <b>3) 1,4</b> 4) 2,4</p>

*Best of luck for the future!*