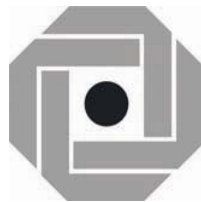


LATERAL ENTRY TEST - 2010

(LET-2010)

conducted by



LBS Centre for Science & Technology

(A Govt. of Kerala Undertaking)
Nandavanam, Palayam

Thiruvananthapuram - 695 033

Phone : 0471 - 2560312,2560313,2560314,2560311

Email : mail@lbscentre.org

Website : www.lbskerala.com
www.lbscentre.org

LATERAL ENTRY TEST 2010

Scheme approved by Government as per G.O.(Rt)No.480/10/H.Edn. dated 08/03/2010

1. Introduction

1.1 Lateral Entry Scheme is intended to admit meritorious Diploma holders to the Second year/ Third Semester of the B.Tech Courses to acquire a Degree in Engineering. Lateral Entry Scheme is approved by Government of Kerala as per G.O.(MS)No.156/2002/H.Edn. dated 13.11.2002 for 10% of the sanctioned seats in addition to total seats. In order to maintain uniformity among various schemes of Diploma holders, AICTE has suggested a state level Entrance Examination for the selection.

1.2 The admission will be subject to regulations of the Universities concerned.

2. Institutions, Courses and Intake

The list of various Engineering Institutions, the courses/branches offered and the number of seats available in each branch will be published in the website "www.dtekerala.gov.in" before the ensuing online allotment.

3. Fee Structure

Fee structure of the courses will be announced before the allotment in the website.

4. Eligibility for admission

4.1 Candidates who have passed Diploma in Engineering awarded by the State Board of Technical Education or Equivalent after undergoing regular course of three years in an approved institution and having a minimum of 60% marks in the final year are eligible for admission. Relaxation of 5% marks will be allowed to SEBC candidates whose annual family income does not exceed Rs.4.5 Lakhs. For candidates belonging to SC/ST community, a pass in the qualifying examination will be sufficient.

4.2 Those who are appearing for the final year diploma examination are also eligible to apply subject

to the condition that they will produce the marklist at the time of admission.

4.3 Maximum age as on the last date of submission of application will be 28 years.

4.4 Non-Keralites are also eligible to apply but their admission will be restricted to the Private Self-financing Institutions and non-Government seats in the Government controlled Self financing institutions.

4.5 Candidates will be admitted only to the branch of Engineering as per the equivalency given in Annexure A.

5. Reservation of seats

5.1 Government seats are available in all Government and Aided Engineering Colleges.

5.2 The availability of Government seats in Government controlled and other Private Self Financing Engineering Colleges will be announced before the ensuing online admission.

5.3 15% of seats under Lateral Entry are reserved as Management seats in Aided Engineering Colleges and remaining 85 % will be allotted as Government seats.

5.4 Communal reservation for candidate belonging to Socially and Economically Backward Classes (SEBC) and SC/ST category will be followed as per usual norms.(Ezhava-9%, Muslim-8%, Latin Catholic other than Anglo Indian-2%, B.H- 5%, Backward Christian-1%, Kudumbi-1%, Scheduled Caste- 8% and Scheduled Tribe-2%)

5.5 3% seats are reserved for physically disabled candidates. Candidates claiming reservation under physically disabled quota shall have a minimum of 40% disability. A disability Certificate from the District Medical Board has to be attached along with the application. Such candidates are also required

to produce a certificate obtained from a Medical officer not below the rank of Assistant Surgeon to ensure the fitness of candidates to undergo the course.

5.6 One seat each is reserved for Electronics and Communication Engineering, Electrical & Electronics Engineering, Civil Engineering, Mechanical Engineering, Computer Science Engineering and Information Technology branch for defence quota. For claiming reservation in this quota, relevant certificate should be attached.

5.7 80% of the available seats in Information Technology branch is reserved for the Diploma Holders in Information Technology.

6. Claim for Communal Reservation

6.1 Candidates belonging to SEBC whose annual family income (annual income of all members in the family from all sources taken together) is upto Rs. 4.5 lakhs are eligible for reservation under this category.

6.2 Candidates claiming reservation under SEBC category should produce both community and income certificates obtained from the concerned Village Officer in the space provided in the body of the application form.

6.3 The candidates claiming reservation under SC/ST quota should produce Community Certificate in the space provided in the body of the application form.

6.4 In the absence of SC/ST candidates, their seats will be filled from OEC category and they have to furnish Community and Income Certificates obtained from the Village Officer in the space provided in the body of the application form.

6.5 Candidates who are not eligible for communal reservation benefit and who wish to be considered for any scholarship/concession based on the family income that may be announced by the Government/ College/Admitting Authority at any time after the

submission of application should also submit the income certificate from the concerned authorities at the time of submission of application itself.

7. Application Forms

Application forms and Prospectus can be downloaded from the websites www.lbskerala.com or www.lbscentre.org. Application fee is Rs.500/- for general candidates and Rs.250/- for SC/ST candidates, which can be paid by Demand Draft drawn in favour of Director, LBS Centre for Science and Technology, Thiruvananthapuram payable at Thiruvananthapuram, from a Nationalised Bank. ST Candidates whose annual income is below Rs.40,000/- are exempted from paying application fee on condition that they produce income certificate for the same.

8. Submission of Applications

Application forms duly filled up should reach the Director, LBS Centre for Science & Technology, Nandavanam, Palayam, Thiruvananthapuram - 695 033 by Registered Post/ Person. The last date for the receipt of Application is as per the schedule given in Annexure B.

9. Entrance Examination

9.1 State level Entrance Test for a duration of 2 hours will be conducted by the LBS Centre for Science and Technology, Thiruvananthapuram for the selection.

9.2 Examination Centres will be at Thiruvananthapuram, Ernakulam and Kozhikode. Admit Cards for the Examination can be downloaded from website "www.lbskerala.com or www.lbscentre.org"

9.3 The Entrance Test will be on selected subjects of first year B.Tech course and English language as per the scheme and syllabus given in the Annexure-C. The rank list will be published by LBS Centre for Science & Technology, Thiruvananthapuram.

9.4 Candidates should secure a minimum of 20% marks in the entrance test to become eligible for the inclusion in the rank list.

10. Valuation and Declaration of Results

10.1 A fully computerised system has been adopted for the valuation of the answer scripts using Optical Mark Reader (OMR) system and for the results.

10.2 The valuation or scoring will be error free under the above system and hence there is no provision for revaluation or rechecking of the answer scripts or recounting of the marks.

10.3 The marks secured by the candidates will not be disclosed under any circumstances and any such enquiries will not be entertained.

Thiruvananthapuram
08/03/2010

11. Allotment

11.1 The allotment of Seats will be made by the Director of Technical Education in accordance with the candidate's rank in the Entrance Examination and availability of seats in the various categories through the website "www.dtekerala.gov.in".

11.2 The selection for admission will be provisional and subject to the verification of the original documents by the concerned Principals at the time of admission.

11.3 Any other details not specifically covered by the clauses given in the Prospectus will be decided by the undersigned and his decision will be final. He is also empowered to cancel any admission found to be illegal subsequent to the admission.

11.4 All disputes pertaining to the Examination, or admission shall fall within the jurisdiction of the Hon'ble High Court of Kerala.

SD/-

DIRECTOR OF TECHNICAL EDUCATION

DESCRIPTION OF DIPLOMA AND CODE

Branch Code	Name of Branch
01	Applied Electronics
02	Architecture
03	Automobile
04	Bio-Medical Engg.
05	Chemical Engineering
06	Civil Engineering
07	Computer Application and Business Management
08	Computer Engineering
09	Computer Hardware Maintenance
10	Electrical
11	Electronics
12	Electronics and Aviation
13	Electronics and Communication
14	Electronics and Instrumentation
15	Electronics Production Technology
16	Information Technology
17	Instrument Technology
18	Mechanical
19	Medical Electronics
20	Medical Instrumentation
21	Plastic Moulding Technology from CIPMT
22	Polymer Technology
23	Printing Technology
24	Quantity Survey and Construction Management
25	Telecommunication Technology
26	Tool and Die
27	Wood and Paper Technology
28	Diploma in any other Branches

(BASIC DATA)

OMR ANSWER SHEET

(ANSWERS)

NOTE

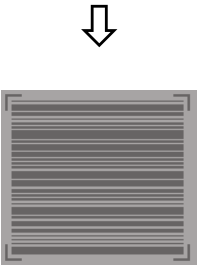
- ★ Please read the general instructions given overleaf for filling up each item given below.
- ★ Any error in filling the required items may upset your performance.

IF A
CANDIDATE
TAMPERS WITH
THE BARCODE,
HE/SHE WILL BE
DISQUALIFIED

NOTE

- ★ Please read the Instructions for marking answers given overleaf.
- ★ Start answering only when you are asked to do so by the Invigilator.

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BAR CODE

3. Name of the Examination

4. Date of the Examination

5. Roll No.	6. Qn. Booklet No.*

7. Name of Candidate

8. Certified that the above entries are checked and found to be correct
<p align="center">..... Signature of the Candidate</p> <p align="center">..... Signature of the Invigilator</p>



<ol style="list-style-type: none"> 1. (A B C D) 2. (A B C D) 3. (A B C D) 4. (A B C D) 5. (A B C D) 6. (A B C D) 7. (A B C D) 8. (A B C D) 9. (A B C D) 10. (A B C D) 11. (A B C D) 12. (A B C D) 13. (A B C D) 14. (A B C D) 15. (A B C D) 16. (A B C D) 17. (A B C D) 18. (A B C D) 19. (A B C D) 20. (A B C D) 21. (A B C D) 22. (A B C D) 23. (A B C D) 24. (A B C D) 25. (A B C D) 26. (A B C D) 27. (A B C D) 28. (A B C D) 29. (A B C D) 30. (A B C D) 31. (A B C D) 32. (A B C D) 33. (A B C D) 34. (A B C D) 35. (A B C D) 36. (A B C D) 37. (A B C D) 38. (A B C D) 39. (A B C D) 40. (A B C D) 41. (A B C D) 42. (A B C D) 43. (A B C D) 44. (A B C D) 45. (A B C D) 46. (A B C D) 47. (A B C D) 48. (A B C D) 49. (A B C D) 50. (A B C D) 51. (A B C D) 52. (A B C D) 53. (A B C D) 54. (A B C D) 55. (A B C D) 56. (A B C D) 57. (A B C D) 58. (A B C D) 59. (A B C D) 60. (A B C D) 	<ol style="list-style-type: none"> 61. (A B C D) 62. (A B C D) 63. (A B C D) 64. (A B C D) 65. (A B C D) 66. (A B C D) 67. (A B C D) 68. (A B C D) 69. (A B C D) 70. (A B C D) 71. (A B C D) 72. (A B C D) 73. (A B C D) 74. (A B C D) 75. (A B C D) 76. (A B C D) 77. (A B C D) 78. (A B C D) 79. (A B C D) 80. (A B C D) 81. (A B C D) 82. (A B C D) 83. (A B C D) 84. (A B C D) 85. (A B C D) 86. (A B C D) 87. (A B C D) 88. (A B C D) 89. (A B C D) 90. (A B C D) 91. (A B C D) 92. (A B C D) 93. (A B C D) 94. (A B C D) 95. (A B C D) 96. (A B C D) 97. (A B C D) 98. (A B C D) 99. (A B C D) 100. (A B C D) 101. (A B C D) 102. (A B C D) 103. (A B C D) 104. (A B C D) 105. (A B C D) 106. (A B C D) 107. (A B C D) 108. (A B C D) 109. (A B C D) 110. (A B C D) 111. (A B C D) 112. (A B C D) 113. (A B C D) 114. (A B C D) 115. (A B C D) 116. (A B C D) 117. (A B C D) 118. (A B C D) 119. (A B C D) 120. (A B C D)
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* Should be filled up after receiving the Question-Booklet.

GENERAL INSTRUCTIONS

Fill in the boxes and darken the appropriate bubbles using a **black/blue ink ball point pen.**

Entries regarding the Question Booklet No. should be filled up only after receiving the Question Booklet.

At the end of the Examination, the Candidate will hand over the OMR Answer Sheet to the Invigilator,

WARNING

- Pen Marking once made is final.
- Trying to erase an already marked bubble might leave a hole (tear) on the OMR Sheet or make dark smudges which will give an improper result with OMR reader.
- Trying to darken an already erased bubble will also lead to an unpredictable result.
- In the case of Improper bubbling/erasing/whitening etc, the reading of the OMR Machine will be taken as final and any arguments to defend such actions will not be entertained.
- To avoid any such misinterpretation, make sure that only one bubble corresponding to the correct response is darkened against each question. All other options should be left blank. Start darkening the bubble only after reading the question thoroughly and deriving at the correct response.
- Use of white fluid or any other correction fluid to erase the pen marking once made is not permitted.

INSTRUCTIONS FOR MARKING ANSWERS

Mark your answers by darkening the appropriate bubbles with a black/blue ink ball point pen. Do not use pencil. Use of fountain pen, Gel pen or sketch pen and use of any color ink other than black/blue are not permitted.

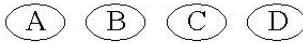


Marking should be dark and the bubbles should be filled completely.

Please darken only one bubble for each question.









Once darkened, the bubble should not be erased.

Please make the marks only in the spaces provided. Do not make any stray marks ELSEWHERE in the Answer Sheet.

Correct method of marking answer.

1. 
2. 
3. 

Here are some wrong methods of marking answers

-  Use of tick mark
-  Use of Cross mark
-  Use of dot (.)
-  Use of Line Mark
-  Partially or Half filled Bubble
-  Marks outside the Bubble
-  More than one darkened bubble
-  More than one Marking

INSTRUCTIONS FOR FILLING THE OMR ANSWER SHEET

General Instructions

1. The candidate should bring a black/blue ink ball-point pen and a card board or clip board, for the Examination.
2. The candidate shall be present at the Examination Hall 30 Minutes before the prescribed time for the commencement of the Examination.
3. The Question paper will be given in the form of a Question booklet bearing Booklet Number on the front page which the candidate is required to mark in the OMR sheet.
4. Rough work/calculations can be made in the blank sheet provided with the Question booklet.
5. Calculator, Logarithm table, Mobile phone and other Electronic equipments will not be allowed in the examination hall.
6. Separate OMR Answer Sheet will be given to mark answers.
7. Each Answer sheet will be having a unique pre-printed BAR CODE that will be used as a secret code against which the evaluation takes place. If a candidate tampers, mutilates or damages the bar code, he/she will be disqualified and his/her candidature will be cancelled.
8. Extra care is needed while handling the OMR Answer sheet.

Special Instructions

1. A specimen copy of the OMR Answer sheet is attached for familiarization.
2. The Answer sheet has two parts- "BASIC DATA" on the left side and "ANSWERS" on the right, with a thin perforation in between length wise. Fill in all the entries on the left side (Basic Data part) before beginning to answer questions.
3. BASIC DATA (left side of the sheet).
The boxes and appropriate bubbles should be filled in with black/blue ink ball point pen.
4. Roll number: Fill in the Roll Number as given in your Admit Card. The boxes and appropriate bubbles should be filled in with black/blue ink ball point pen. The Roll number should be entered without any correction or over writing.
5. Question Booklet Numbers*: Candidate should make the entry regarding the "Question Booklet Number" (against item 2&6) in the OMR Answer sheet based on the serial number given on the top of the Question booklet.
* **Note:** The "Question Booklet Number" should be filled up only after receiving the Question booklet.
6. Name of the Examination: Write the name of the examination abbreviated suitably, as LET 2010.
7. Date of Examination: Write down the Date of Examination.
8. Fill up the Roll No.
9. Fill up the Question Booklet No.
10. Name of the candidate is to be entered as given in the Admit Card.
11. The candidate has to sign against item 8 and the signature should be identical with the signature that is affixed in the Admit Card and in the Attendance Sheet. The item "Signature of the Invigilator" will be filled in by the concerned person.

12. ANSWERS : (Right side of the sheet)
Do not write your Roll number or name or make any stray mark on this part of the sheet. Do the marking for answering only in the spaces provided.
13. Each question will have four suggested answers given as choices (A), (B), (C) & (D). The most appropriate answer will have to be selected. Thereafter, using black/blue ink ball point pen darken the bubble corresponding to the most appropriate answer. For example, if the answer to question No. 2 is C, bubble C has to be darkened as shown below.

Qn. No.	Answer Choice			
1	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D
2	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D
3	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D

14. Darken only one bubble for each question. The bubble should be filled as completely as possible and let dark enough. Once darkened the bubbles should not be erased. Erasing of an answer and darkening it again may adversely affect the OMR valuation.
15. **Special attention:**
In the OMR answer sheet, provision has been given to mark answers for a total number of 120 questions.
16. Candidates are warned that they should enter only the necessary information as required in the OMR answer sheet on the left part. Any additional information which is not required and which may help to identify the candidate, that is made on any part of the OMR sheet, will disqualify the candidate and his/her candidature will be cancelled without any further intimation in this regard.

Warning: Any mistake in filling up the data required in the OMR answer sheet will affect the valuation adversely.

ANNEXURE A

EQUIVALENCY OF BRANCHES

Sl. No.	Specialization in Diploma Course	Branch Equated to BTech Course
1	Applied Electronics	Electronics and Communication/Applied Electronics and Instrumentation Engineering
2	Architecture	Civil Engineering
3	Civil	
4	Quantity Survey & Construction Mangmt.	
5	Biomedical Engineering/ Medical Electronics	Biomedical Engineering
6	Chemical	Chemical Engineering
7	Computer Appln. & Business Mangmt.	Computer Science and Engineering
8	Computer Engineering	
9	Computer Hardware Maintenance	
10	Electrical	Electrical and Electronics Engineering
11	Electronics and Instrumentation	Electronics and Communication/Electronics and Instrumentation Engineering
12	Electronics	Electronics and Communication Engineering
13	Electronics and Aviation	
14	Electronics and Communication	
15	Electronics Production Technology	
16	Medical Electronics/Bio Medical Engg.	
17	Medical Instrumentation	
18	Telecommunication Technology	
19	Automobile	Mechanical Engineering/Automobile Engg./Mechanical (Automobile)
20	Tool and Die	Mechanical Engineering/Industrial Engineering/ Production Engineering/Mechanical (Production)
21	Wood and Paper Technology	
22	Plastic Moulding Technology from CIPMT	
23	Mechanical	
24	Instrument Technology	Instrumentation and Control Engg/Applied Electronics&Instrumentation Engg / Electronics and Instrumentation Engineering
25	Information Technology	Information Technology
26	Polymer Technology	Polymer Technology
27	Printing Technology	Printing Technology
28	Mechanical	Automobile Engineering
29	Diploma in any Branch	Information Technology

ANNEXURE B

LET-2010-TIME SCHEDULE	
ACTIVITY	DATE
1. Online Registration	From 12/04/2010 to 24/04/2010 5 PM
2. Last Date of Receipt of Downloaded Application	28/04/2010 before 5 PM
3. Downloading of Admit Card	From 11/05/2010 to 14/05/2010
4. Date of Examination	15/05/2010 from 10 AM to 12 PM
5. Publication of Result	29/05/2010
6. Online filing of options	From 07/06/2010 to 11/06/2010 5 PM
7. First Allotment	15/06/2010
8. Admission (First Allotment)	17/06/2010 & 18/06/2010
9. Rearranging Higher Options	From 15/06/2010 to 18/06/2010 5 PM
10. Second Allotment	21/06/2010
11. Admission (Second Allotment)	23/06/2010 & 24/06/2010
12. Rearranging Higher Options	From 21/06/2010 to 24/06/2010 5 PM
13. Third Allotment	28/06/2010
13. Admission (3rd Allotment)	30/06/2010

ANNEXURE C

SCHEME AND SYLLABUS

The Examination is Objective type with 120 Questions to be attempted in 2 Hrs. The subjects include English, Mathematics, Engineering Mechanics, IT and Computer Science, Civil Engineering, Mechanical Engineering, Electrical Engineering and Electronics & Communication Engineering.

ENGLISH

SYLLABUS

For English, out of the 10 marks to be awarded, 5 marks will be for questions based on a given passage and the remaining 5 marks for Basic Grammar and General English of +2 Standard.

SAMPLE QUESTIONS

Answer questions 1-5 based on the given passage.

About four hundred years ago, many people believed that they lived on stationary earth, which itself is situated at the centre of the universe. The world beyond the solar system was a mystery to all. The submicroscopic domain of atoms and molecules was completely unknown. Not even a single law of nature was accurately formulated. The Copernican theory of the solar system (the theory in which the sun occupies the central position) had been published but it had so many objections against it. There was scarcely any activity that could be called as Science. Mathematics was just in its infancy.

1. Four hundred years ago, the popular belief was that _____
A) there was a world beyond the solar system
B) the law of nature was not accurate
C) the earth was fixed
D) there was no technology
2. There was scarcely any activity called Science means _____
A) Scientific knowledge was inadequate
B) Copernican theory was objected
C) They lived on stationary earth
D) Law of nature was accurate
3. The opposite of *accurate* is
A) exact
B) inaccurate
C) disaccurate
D) unaccurate
4. Beyond means
A) on the farther side
B) domain of atoms
C) at the centre
D) a mystery

Fourier Series:

Even functions, odd functions, periodic functions-Dirichelet's condition-Euler's formula. Functions with period 2π and $2L$. Half range sine and cosine series. Laplace transforms -Properties-Inverse Transforms.

SAMPLE QUESTIONS

- If A and B are two square matrices of the same order, then $(A+B)^2$ is
A) $A^2 - AB + BA + B^2$ B) $A^2 + AB + BA + B^2$
C) $A^2 - AB - BA + B^2$ D) $A^2 + AB - BA + B^2$
- If $\begin{bmatrix} 2 & -1 & 4 \\ x & 0 & 1 \\ 1 & 2 & 0 \end{bmatrix}$ is a singular matrix then x is
A) $5/4$ B) $-5/8$ C) $8/5$ D) $5/8$
- Adjoint of the matrix $\begin{bmatrix} 1 & 2 & 1 \\ 3 & 2 & 2 \\ 1 & 1 & 2 \end{bmatrix}$ is
A) $\begin{bmatrix} 2 & -4 & 1 \\ -3 & 1 & 1 \\ 2 & 1 & -4 \end{bmatrix}$ B) $\begin{bmatrix} 2 & -3 & 2 \\ -4 & 1 & 1 \\ 1 & 1 & -4 \end{bmatrix}$
C) $\begin{bmatrix} 2 & 1 \\ 1 & 0 \end{bmatrix}$ D) $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 2 & 2 \\ 1 & 3 & 1 \end{bmatrix}$
- Inverse of the matrix $\begin{bmatrix} 2 & 3 \\ 2 & 5 \end{bmatrix}$ is
A) $\begin{bmatrix} -2 & 3 \\ 2 & -5 \end{bmatrix}$ B) $\begin{bmatrix} 5 & 2 \\ 3 & 2 \end{bmatrix}$
C) $\begin{bmatrix} 5 & -3 \\ -2 & 2 \end{bmatrix}$ D) $\begin{bmatrix} 2 & -3 \\ -2 & 5 \end{bmatrix}$
- Rank of the matrix $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & 2 \\ 2 & 3 & 4 \end{bmatrix}$ is
A) 2 B) 0 C) 3 D) 1

6. The equation $AX = B$ is consistent if rank of the coefficient matrix and augmented matrix are
 A) equal B) not equal
 C) 1 D) none of these
7. The characteristic equation of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ is
 A) $\lambda^2 + 7\lambda + 6 = 0$ B) $\lambda^2 + 6\lambda + 6 = 0$
 C) $\lambda^2 - 7\lambda + 6 = 0$ D) $\lambda^2 + 6\lambda + 7 = 0$
8. The second derivative of $b\sin^3\theta$ with respect to $a\cos^3\theta$ is
 A) $\frac{b\operatorname{cosec}\theta}{3a^2\sec^4\theta}$ B) $\frac{b\operatorname{cosec}\theta \sec^4\theta}{3a^2}$
 C) $\frac{b\sec^4\theta}{3a^2}$ D) $\frac{b\sec^4\theta}{3a^2\operatorname{cosec}\theta}$
9. The n^{th} derivative of $x \sin x$ with respect to x is
 A) $x \cos x$
 B) $x \sin x (x + (n\pi)/2) + \sin (x+(n-1)\pi/2)$
 C) $x \sin (x+n\pi/2) + n \sin (x+(n-1)\pi/2)$
 D) $x \cos n\pi/2$
10. $\lim_{x \rightarrow 3} \frac{x^2 - 3x}{x^2 - 9}$ is
 A) 3 B) 6 C) 1/3 D) 1/2
11. Radius curvature of the parabola $y^2 = 4ax$ at $(at^2, 2at)$ is
 A) $\frac{2a(1+t^2)^{3/2}}{t}$ B) $\frac{a(1+t)^{3/2}}{t^2}$
 C) $\frac{2(1+t^2)^{3/2}}{t}$ D) $\frac{2a(1+t^2)^{3/2}}{t^2}$
12. The maximum value of the function $2+2x+2y-x^2-y^2$ is
 A) 2 B) 1 C) 3 D) 4
13. The partial derivative of $ax^2+2hxy+by^2$ with respect to x is
 A) $2ax + 2by$ B) $2ax + 2hy$
 C) $ax^2 + 2hx$ D) $2hx + 2by$
14. If $f(x,y)$ is a homogeneous function of degree n , possessing continuous partial derivatives of first order then
 A) $x \frac{\partial f}{\partial x} + y \frac{\partial f}{\partial y} = nf$ B) $x \frac{\partial^2 f}{\partial x^2} + y \frac{\partial^2 f}{\partial y^2} = n^2 f^2$
 C) $x \frac{\partial f}{\partial x} + y \frac{\partial f}{\partial y} = f$ D) $\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} = nf$

15. The series $1 - 1 + 1 - 1 + \dots$ is
 A) convergent B) divergent
 C) oscillatory D) none of these
16. The series $\sum 1/n^p$ is convergent if p is
 A) greater than one B) equal to one
 C) less than one D) equal to zero
17. An absolutely converging series is
 A) divergent B) conditionally convergent
 C) convergent D) oscillatory
18. $\frac{\cos x}{x^2 - x}$ is
 A) periodic function B) even function
 C) odd function D) none of these
19. $1 + 1/2^2 + 1/3^2 + 1/4^2 + \dots$ is
 A) $\pi^2/6$ B) $2\pi^2/3$ C) $\pi/6$ D) $\pi/8$
20. The Laplace transform of e^{at} is
 A) $1/(s+a)$ B) $s/(s^2+a^2)$ C) $1/(s-a)$ D) $a/(s^2+a^2)$

ENGINEERING MECHANICS

SYLLABUS

Units-Dimensions-Vector & scalar quantities-Laws of mechanics-Elements of vector algebra-Principles of Statics-Freebody diagram-Composition & resolution of forces-Resultant of & equilibrant – Concurrent forces-Tringular forces- Lami's theorem- Centre of gravity- Moment of inertia-Coplannar forces-Friction.

Plane trusses-Different types of support-Reactions at supports-Method of joints-Method of sections-Funicular polygon-Maxwell diagram-Couples in space-Equilibrium of general system of forces in space.

Kinematics of a particle-Simple relative motion-Definition of particle-Velocity and acceleration-translation and rotation-Rectangular and cylindrical coordinates-particle dynamics-Central force motion.

Principles of dynamics-Motion of a particle acted by a constant force-Force as a function of time-Force proportional to displacement-Free vibrations-D' Alemberts principle-Momentum and impulse-Work and energy-Ideal system-Conservation of energy-Impact-Curvilinear motion-Projectiles-Rotation – Torsional vibration-Simple and compound pendulum-Collision of bodies.

SAMPLE QUESTIONS

- The force acting on a point on the surface of a rigid body may be considered to act
 - at the center of gravity of the body
 - on the periphery of the body
 - on any point on the line of action of the force
 - at any point on the surface normal to the line of action of the force
- If the resultant of two forces P and Q acting at an angle θ makes an angle α with P, then $\tan \alpha$ equals
 - $(P \sin \theta) / (P - Q \cos \theta)$
 - $(Q \sin \theta) / (P + Q \cos \theta)$
 - $(P \sin \theta) / (P + Q \tan \theta)$
 - $(Q \sin \theta) / (Q + P \sin \theta)$
- A point subjected to a number of forces will be in equilibrium, if
 - sum of resolved parts in any two directions at right angles, are both zero
 - algebraic sum of the forces is zero
 - two resolved parts in any two directions at right angles are equal
 - algebraic sum of the moments of the forces about the point is zero
- The forces which meet at one point and have their lines of action in different planes are called
 - coplanar non-concurrent force
 - non-coplanar concurrent forces
 - non-coplanar non-current forces
 - intersecting forces
- The center of gravity of a quadrant of a circle lies along its central radius at a distance of
 - 0.2 R
 - 0.3 R
 - 0.4 R
 - 0.6 R
- The C.G. of a right circular cone lies on its axis of symmetry at a height of
 - $h/2$
 - $h/3$
 - $h/4$
 - $h/6$
- The units of inertia of mass, are
 - kg/m
 - kg/m^2
 - m^4
 - m^3
- Moment of inertia of a square of side b about an axis through its center of gravity, is
 - $b^3/4$
 - $b^4/12$
 - $b^4/3$
 - $b^4/8$
- The moment of inertia of a thin spherical shell, is
 - $Mr^4/2$
 - Mr^2
 - $2/3Mr^2$
 - $2/5Mr^2$
- The angle of friction is:
 - The ratio of the friction and the normal reaction
 - The force of friction when the body is in motion
 - The angle between the normal reaction and the resultant of normal reaction and limiting friction
 - The force of friction at which the body is just about to move

11. The following is not a law of static friction:
- A) The force of friction always acts in a direction opposite to that in which the body tends to move
 - B) The force of friction is dependent upon the area of contact
 - C) The force of friction depends upon the roughness of the surface
 - D) The magnitude of the limiting friction bears a constant ratio to the normal reaction between two surfaces
12. Which one of the following statements is true?
- A) The tangent of the angle of friction is equal to coefficient of friction
 - B) The angle of repose is equal to angle of friction
 - C) The tangent of the angle of repose is equal to coefficient of friction
 - D) All the above
13. Equation of motion of a point in a straight line, is
- A) $v = u + ft$
 - B) $S = ut + \frac{1}{2} ft^2$
 - C) $2fs = v^2 - u^2$
 - D) all the above
14. A particle move along a straight line such that distance x traversed in t seconds is given by $x = t^2(t + 1)$, the acceleration of the particle, will be
- A) $3t^3 - 2t$
 - B) $3t^3 + 2t$
 - C) $6t - 2$
 - D) $6t + 2$
15. Time of flight of a projectile on a horizontal plane, is
- A) $2u \sin \alpha/g$
 - B) $2u \cos \alpha/g$
 - C) $2u \tan \alpha/g$
 - D) $2u \cot \alpha/g$

COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

SYLLABUS

1. Computer organization:- Central processing unit, memory, input devices, output devices, secondary storage devices, machine language, assembly language and high level language.
2. System software:- Assembler, loader, linker, operating systems, editors, compilers, debuggers.
3. Computer programming (in C language):- Data types, type conversion, simple and compound statements, usage of standard library, control structures, functions, arrays, pointers, structure, file handling.
4. Data base systems:- Relational Data Base Management Systems, SQL.
5. Multimedia-Multimedia hardware, sound cards, CD ROMS, full motion Digital video.
6. Computer networks:- ISO/OSI protocols, TCP/IP, Inter connecting network devices, Ethernet cards, cables, Connectors, hubs, switches, routers.
7. Internet:- Introduction to FTP, TELNET, Email, web browsers and Web servers.

SAMPLE QUESTIONS

1. The larger the RAM of a computer, the faster is its speed, since it eliminates
 - A) need for ROM
 - B) need for external memory
 - C) frequent disk I/Os
 - D) need for a data-wide path

2. Which of the following is an example of a spooled device?
 - A) A line printer used to print the o/p of a number of jobs
 - B) A terminal used to enter input data to a running program
 - C) A secondary storage device in a virtual memory system
 - D) A graphical display device

3. UNIX operating system
 - A) is multi-user
 - B) is multi tasking
 - C) can run on PC's and larger systems
 - D) all the above

4. The errors that can be pointed out by the compiler are
 - A) Syntax errors
 - B) Semantic errors
 - C) Logical errors
 - D) Internal errors

5. Which of the following is not a multi user operating system?
 - A) MS-DOS
 - B) Linux
 - C) Windows 2000
 - D) Unix

6. How many times will the following loop be executed?


```

X=500;
While (x<=500)
{
  x=x-600;
  if (x<0) break;
}
      
```

 - A) 0
 - B) 1
 - C) 500
 - D) 100

7. The function sprintf () works like printf () but operates on
 - A) data in a file
 - B) stderr
 - C) stdin
 - D) string

8. An indexing operation
 - A) sorts a file using a single key
 - B) sorts a file using two keys
 - C) establishes an index for a file
 - D) both B and C above

9. Which of the following is a database administrator's function?
 - A) backing up the database
 - B) performance monitoring
 - C) user coordination
 - D) all of the above

SAMPLE QUESTIONS

- The standard size of a masonry brick, is
A) 18cm x 8cm x 8cm B) 19cm x 9cm x 9cm
C) 20cm x 10cm x 10cm D) 21cm x 11cm x 11cm
- The portion of the brick without a triangular corner equal to half the width and half the length, is called
A) closer B) queen closer
C) king closer D) squint brick
- Good quality cement contains higher percentage of
A) Tricalcium silicate B) Di-calcium silicate
C) Tri-calcium aluminate D) Tetra calcium alumino ferrite
- Veneering means
A) carving out designs on timber planks
B) chemically treating timber planks
C) thick layer of superior wood glued to inferior wood
D) thin layer of superior wood glued to inferior wood
- Pick up the incorrect statement from the following
A) The function of foundation is to distribute the load of super structure over a large bearing area
B) No timbering is required for shallow trenches
C) Shallow foundations can be constructed on made-up soil
D) Black cotton soil is very good for foundation bed
- Dampness causes
A) efflorescence B) bleaching of paints
C) crumbling of plaster D) growth of termites
- The brick laid with its breadth parallel to the face of a wall, is known as
A) header B) stretcher
C) closer D) none of these
- The type of bond in a brick masonry containing alternate courses of stretchers and headers, is called
A) Flemish bond B) English bond
C) Stretcher bond D) Header bond
- The curvature of the earth's surface, is taken into account only if the extent of survey is more than
A) 100 sq km B) 160 sq km C) 200 sq km D) 260 sq km

10. The main principle of surveying is to work
 - A) from part to the whole
 - B) from whole to the part
 - C) from higher level to the lower level
 - D) from lower level to higher level

11. Correct distance obtained by an erroneous chain is:
 - A) $(\text{Erroneous chain length} \times \text{Observed distance}) / \text{Correct chain length}$
 - B) $(\text{Correct chain length} \times \text{Observed distance}) / \text{Erroneous chain length}$
 - C) $(\text{Correct chain length} \times \text{Erroneous chain length}) / \text{Observed distance}$
 - D) None of these

12. In chain surveying a tie line is primarily provided
 - A) to check the accuracy of the survey
 - B) to take offsets for detail survey
 - C) to avoid long offsets from chain lines
 - D) to increase the number of chain lines

13. Determining the difference in elevation between two points on the surface of the earth, is known as

A) leveling	B) simple leveling
C) differential leveling	D) longitudinal leveling

14. An imaginary line joining the points of equal elevation on the surface of the earth, represents

A) contour surface	B) contour gradient
C) contour line	D) level line

15. The contour interval is kept inversely proportional to
 - A) time and expense of field work
 - B) steepness of the configuration of the area
 - C) scale of the map
 - D) all the above

MECHANICAL ENGINEERING

SYLLABUS

Thermodynamics :

Definitions and basic concepts- system, properties, state, process, cycle – heat and work – thermodynamic equilibrium. Zeroth law of thermodynamics – concept of temperature – temperature scales. First law of thermodynamics – concepts of internal energy and enthalpy. Second law of thermodynamics- Clausius and Kelvin –Plank statements- concept reversibility, availability and entropy. Thermodynamic processes-constant volume, constant pressure, isothermal, adiabatic, polytropic processes, throttling and free expansion, p-v and T-s diagrams- work done, heat exchanged, change in internal energy and change in entropy during the above processes. Air cycles – Carnot, Otto and Diesel cycles- air standard efficiency.

IC engines:

Working and comparison of two stroke and four stroke petrol and diesel engines – various systems – air system, fuel system, ignition system, governing system.

Steam Boilers and Turbines:

Properties of steam- dryness fraction, enthalpy, entropy. Classification of boilers, Boiler mountings and accessories. Types of steam turbines- simple impulse and reaction type - parts of turbines, compounding of turbines.

Pumps:

Types - centrifugal, reciprocating, gear and jet – applications – criteria for choice of pumps.

Refrigeration and Air Conditioning:

Simple vapour compression and vapour absorption refrigeration systems - Refrigerants. Psychrometry – definitions of terms. Air conditioning – parts of an A/C unit.

Mechanical power transmission systems:

Belt drive- parts, different types- rope drive, chain drive- types, gear drives – types –spur, helical, herring bone, bevel, spiral, skew, hypoid, worm and wheel, rack and pinion. Velocity ratio, comparison and fields of application. Gear trains-simple, compound and epicyclic.

Manufacturing processes:

Primary, secondary and tertiary production processes - moulding, sand casting, die casting, forging, punching, blanking, stamping, coining, rolling, extrusion, wire drawing, turning, boring, thread cutting, tapping, shaping, drilling, milling, reaming, grinding, broaching, honing, lapping, welding, soldering and brazing.

SAMPLE QUESTIONS

- The law which forms the basis of temperature measurement
A) First law of thermodynamics B) Zeroth Law of thermodynamics
C) Second law of thermodynamics D) Boyle's law
- The maximum possible thermal efficiency of a heat engine working between 27 °C and 627 °C is
A) 100 % B) 95.69 % C) 66.67 % D) 45 %
- For an irreversible process,
A) Change in entropy $< \frac{\delta Q}{T}$ B) Change in entropy $> \frac{\delta Q}{T}$
C) Change in entropy $= \frac{\delta Q}{T}$ D) Change in entropy = 0

4. Work done during isothermal process is given by
 A) $W = P_1 V_1 \log (V_2 / V_1)$ B) $W = P_1 V_1 \log_e (V_2 / V_1)$
 C) $W = 0$ D) $W = (P_1 V_1 - P_2 V_2) / (\gamma - 1)$
5. A Diesel Cycle consists of the following process
 A) Two constant volume and two adiabatic processes
 B) Two constant pressure and two adiabatic processes
 C) Two adiabatic, a constant volume and a constant pressure processes
 D) Two adiabatic and two isothermal processes
6. In a petrol engine, the unit which mixes fuel with air is called
 A) cylinder B) carburetor C) radiator D) crank shaft
7. During a throttling process the _____ remains constant
 A) pressure B) temperature
 C) internal Energy D) enthalpy
8. 1.25 kg of wet steam contains 0.25 kg of water in suspension. Dryness fraction of the steam is
 A) 1.25 B) 0.80 C) 0.75 D) 0.25
9. The heat required to convert water at boiling point to dry steam at same temperature is
 A) sensible heat B) latent heat of vapourisation
 C) specific heat D) latent heat of fusion
10. One ton refrigeration refers to
 A) Total weight of the unit
 B) Heat removal rate equivalent to latent heat of fusion of 1 ton of ice at 0 °C in 24 hours
 C) Heat removal rate equivalent to latent heat of fusion of 1 ton of ice at 0 °C in 1 hour
 D) Heat removal rate equivalent to latent heat of fusion of 1 ton of ice at 0 °C in 1 second
11. The top part of a two part moulding box is called
 A) cope B) drag C) runner D) gate
12. The forging process used for increasing the diameter of a bar by reducing its length is termed as
 A) blanking B) bending
 C) upsetting D) roll forging
13. The maximum suction head in a centrifugal pump is
 A) unlimited
 B) between 20 m and 100 m of water
 C) between 5 m and 10 m of water
 D) between 1 m and 5 m of water
14. When the axes of rotation of shafts intersect each other, the type of gears used are
 A) Bevel B) Spur
 C) Helical D) Worm and wheel

15. The cross section of V- belt is
- | | |
|----------------|----------------|
| A) triangular | B) rectangular |
| C) trapezoidal | D) circular |

BASIC ELECTRICAL ENGINEERING

SYLLABUS

SI unit of current, voltage, power and energy-Ohm's law-temperature coefficient of resistance-Kirchoffs laws-solution of series, parallel circuits-Star Delta transformation-magnetic circuits-flux-flux density-mmf-magnetizing force Reluctance-permeability-comparison of Electric and Magnetic circuits-Magnetic leakage-B.H.characteristics-solution of series and parallel magnetic circuits-force experienced by a current carrying conductor in a magnetic field-Electromagnetic induction-Faraday's laws-Lenz's Law-statically induced emf-Dynamically induced emf-self and mutual induction-coefficient of coupling.

Alternating current fundamentals-Generation of alternating currents-wave forms-frequency-period-average value-rms value and form factor. Phasor representation of alternating quantities rectangular and polar form-Analysis of simple ac circuits with resistance inductance and capacitance-concept of impedance and admittance-power and power factor in ac circuits-active and reactive components-solution of RL, RC and RLC circuits-series, parallel and series parallel circuits-Resonance-Q factor-selectivity and bandwidth.

Electrical Drives-principle of operation of ac and dc motors-mechanical characteristics and application of dc series, shunt and compound motors-single phase and three phase induction motors-synchronous motors-Transformer-Principle of operation-emf equation-Ideal transformer-constructional details-losser and efficiency-Use of power, distribution and instrument transformers.

Different methods of wiring for LT installations, Schematic layout of LT switch boards-Earthing of installation-necessity of earthing-plate and pipe earthing-Protective fuses, MCBs, ELCB-Tariffs-Types of LT and HT consumers.

Characteristics of different types of lamps-vapour lamps-incandescent lamps-energy efficient lamps-control accessories of vapour lamps.

Storage batteries-Lead acid and Nickel Cadmium batteries-construction-characteristics-charging and discharging-specification-maintenance.

Methods of bulk generation of electric power, Block schematic layout of generating station-hydro electric, thermal, nuclear stations-Non conventional energy sources-solar, tidal, wind-Economics of generation-load factor-diversity factor-plant factor.

Bulk transmission of electric power-typical power transmission scheme-need for high transmission voltage-substation-substation equipment, primary and secondary transmission and distribution systems-effect of power factor, transmission voltages in Kerala.

SAMPLE QUESTIONS

1. Highest Transmission Voltage in Kerala is
 A) 66Kv B) 400Kv C) 220Kv D) 1000Kv

2. The light source with light quality nearest to natural sun light
 A) Mercury vapour lamp B) Sodium vapour lamp
 C) Fluorescent lamp D) Incandescent lamp

3. The electric motor which provides the highest starting torque
 A) DC series motor B) DC shunt motor
 C) 3Q induction motor D) Single phase induction motor

4. The resistance R of a conductor is inversely proportional to
 A) Resistivity B) Length
 C) Temperature D) Area of section

5. The equivalent resistance of resistors in parallel is always
 A) Higher than the highest of component resistors
 B) Less than the lowest of component resistors
 C) In between the lowest and the highest of component resistors
 D) Equal to the sum of the component resistors

6. A resistor R1 dissipates power P when connected to a certain generator with voltage V. If a resistance R2 is put in series with R1 the power dissipation by R1
 A) decreases
 B) increases
 C) remains the same
 D) any of the above depending upon the value of R1 and R2

7. Two free parallel wires carrying currents in the opposite directions
 A) attract each other
 B) repel each other
 C) do not affect each other
 D) get rotated to be perpendicular to each other

8. An induced emf is produced when a magnet is plunged into a coil. The strength of the induced emf is independent of
 A) the strength of the magnet
 B) number of turns of coil
 C) the resistivity of the wire of the coil
 D) the speed with which the magnet is moved

9. In a step up transformer the number of turns in

A) primary are less	B) primary are more
C) primary and secondary are equal	D) primary are infinite
10. The core of a Transformer is laminated to reduce energy loss due to

A) eddy currents	B) hysteresis
C) resistance in cording	D) none of these
11. The frequency of AC mains in India is

A) 30 Hz	B) 50 Hz	C) 60 Hz	D) 100 Hz
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12. In a circuit containing capacitance only

A) Current lags behind emf by $\pi/2$	B) Current leads emf by $\pi/2$
C) Both are in phase	D) Current leads emf by π
13. The power factor is unity for

A) pure inductor	B) pure capacitor
C) pure resistor	D) either an inductor or a capacitor
14. In a balanced 3 phase circuit the current in the neutral conductor is

A) equal to phase current	B) equal to line current
C) $\sqrt{2}$ times line current	D) zero
15. ELCB gives protection against

A) over voltage	B) over current
C) leakage current to ground	D) under voltage

ELECTRONICS AND COMMUNICATION

SYLLABUS

1. Passive components: Resistors – types, color coding, power rating, Capacitors – types, color-coding, voltage rating, Inductors and Transformers: types.
2. Semiconductors: Crystalline structure – Intrinsic and extrinsic semiconductors, PN Junctions, Electrical characteristics.
3. Diodes: Biasing, Rectifier Circuits.
4. Transistors: NPN and PNP transistors, current flow in a transistor – transistor configurations, FET, Zener diode, SCR, photodiode, phototransistor, LED.
5. Amplifiers: The CE, CB and CC amplifiers, Frequency response, and Power amplifier – single ended power amplifier, Push pull amplifier.
6. Oscillators: Feedback principles, RC and LC Oscillators.

7. Digital circuits: Logical states, Number codes, gates and truth tables. TTL and CMOS. Logic identities, Function minimization, Multiplexer, Demultiplexer, Decoders, Flip-flops, RS, JK, Master slave JK, D and T. Counters, shift registers, ADCs.
8. Electronic Communication: Modulation – AM, FM, Demodulation, Radio receivers, Transmitters, Television, Radar.
9. Electronic Instrumentation: Measurement of current, voltage and power, Cathode ray oscilloscope, Transducers-strain gauges, Thermocouples, Thermistors, RTDS, LVDTs.

SAMPLE QUESTIONS

1. In a capacitor color code sequence, one among the following is correct.
 - A) First band gives the temperature compensation
 - B) Second band gives the second digit
 - C) Third band gives the number of zeros that follow the digit
 - D) Fourth band gives the tolerance.
2. The addition of trivalent impurity to a semiconductor creates

A) holes	B) free electrons
C) zener breakdown	D) covalent bonds
3. In a PN junction, the width of the depletion layer is
 - A) Directly proportional to the square root of the voltage across the layer
 - B) Inversely proportional to the square root of the voltage across the layer
 - C) Proportional to the voltage across the layer
 - D) Inversely proportional to the voltage across the layer
4. What is not true for a center tapped full wave rectifier?
 - A) It is difficult to locate the center tap on the secondary winding
 - B) The DC output is small as each diode utilizing only one half of the transformed secondary voltage
 - C) The diodes used must have high PIV
 - D) It requires 4 diodes
5. What is not true for common collector configuration?
 - A) Very high input resistance
 - B) Low output resistance
 - C) Voltage gain less than unity
 - D) Used for audio frequency applications
6. In a transistor with voltage divider bias, stabilization is provided by

A) R_C	B) R_E	C) R_1	D) R_2
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7. What is true for LC oscillators?
 A) LC Oscillators cannot be used for very high frequencies
 B) Frequency stability of LC oscillators is poorer than RC Oscillators
 C) Works based on principle of negative feedback
 D) Supports miniaturization
8. A simple flipflop
 A) is a 2 bit memory
 B) is a 1 bit memory
 C) is a 4 state device
 D) has nothing to do with memory
9. Which of the following IC has only one input line?
 A) Multiplexer
 B) Demultiplexer
 C) AND gate
 D) BCD to Decimal decoder
10. Superheterodyne principle provides selectivity at the following stage
 A) RF
 B) IF
 C) AF
 D) VHF
11. What is true for frequency modulation?
 A) Noisy reception
 B) Low efficiency
 C) Large operating range
 D) Lack of audio quality
12. In a CRO, a sinusoidal voltage is applied to vertical deflection plates only. What shall we get in the screen?
 A) A horizontal line
 B) A vertical line
 C) A sinusoidal pattern
 D) A spot
13. The signals sent by the TV transmitter to ensure correct scanning in the receiver are called
 A) sync
 B) chroma
 C) luminance
 D) video
14. The video voltage applied to the picture tube of a television receiver is fed in
 A) between grid and ground
 B) to the yoke
 C) to the anode
 D) between grid and cathode
15. If the peak transmitted power in a radar system is increased by a factor of 16, the maximum range will be increased by a factor of
 A) 2
 B) 4
 C) 8
 D) 16
