Roll No. .....

NATIONAL INSTITUTE OF TECHNOLOGY, HAMIRPUR (H.P.)

Mid Semester Examination for I. B.Tech. 2016-2017

Subject Name: Engineering Graphics
Subject Code: ECD-115
Time: 90minutes **[Max. Marks: 20]**

Note:
(i)Attempt all questions
(ii)Assume any data if required.

Que.1 Mark the projection of following points on a common reference line [5]

(i) A, 25mm above HP and 35mm in Front of VP
(ii) B, 25mm above HP and 40mm behind VP
(iii) C, 30mm below HP and 45mm behind VP
(iv) D, 30mm below HP and 45mm behind VP
(v) E, 25mm above HP and in VP

Que.2 A line MN long is parallel to VP and inclined at 30^0 to HP. End M is 35mm above HP and 30mm in front of VP. Draw the projections. [7]

Que.3 The distance between Delhi and Agra is 200km and its equivalent distance on map measures 10cm. Draw a diagonal scale to indicate 223km and 135km. [8]

NATIONAL INSTITUTE OF TECHNOLOGY, HAMIRPUR (HP) - 177 005

Mid-Term Examination, September 2016

CSS and ECS -111: Engineering Mathematics - I

Roll No: Branch

Time: 1:30 hrs Max Marks: 20

Q1. For what values of k, the system of equations $x+y+z=1$, $2x+y+4z=k$, $4x+y+10z=k^2$ has a solution ? Also, find the solutions.

Q2. Find the eigenvalues and eigenvectors of the matrix $\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ and hence reduce the quadratic form $6x^2+3y^2+3z^2-2yz+4zx-4xy$ to a sum of squares.

Q3. (a) Prove that eigenvalues of the Hermitian matrix are real.

(b) Discuss the convergence of the series $\sum \frac{n^2}{2^n}$.

Q4. Test the convergence for the series $\frac{x}{1.2}+\frac{x^2}{3.4}+\frac{x^3}{5.6}+\frac{x^4}{7.8}+\ldots$

Q5. State Euler's theorem on homogeneous function and hence verify the theorem for the function $u=\log\frac{x^2+y^2}{xy}$.

NATIONAL INSTITUTE OF TECHNOLOGY, HAMIRPUR (HP) - 177 005
End-Term Examination, December 2016
ECS-111 : Engineering Mathematics - I

Roll No:
Time: 3:00 hrs

Branch
Max Marks: 60

Q1. (a) Show that eigenvalues of a unitary matrix have absolute value one.

(b) State Cayley-Hamilton theorem and hence find the inverse of the matrix $\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$. **(2 + 5)**

Q2. (a) State the D'Alembert ratio test and discuss the convergence of the series $\sum \frac{x^{n-1}}{(n-1)!}$.

(b) Test the convergence for the series $1 + \frac{x}{2} + \frac{2!}{3^2}x^2 + \frac{3!}{4^3}x^3 + \frac{4!}{5^4}x^4 + \ldots \infty, x > 0$. **(5 + 5)**

Q3. (a) If $x + y + z = u$, $y + z = uv$ and $z = uvw$, show that $\frac{\partial(x,y,z)}{\partial(u,v,w)} = u^2 v$.

(b) State Taylor's theorem and expand $x^2 + xy + y^2$ in powers of $(x - 1)$ and $(y - 2)$.

(c) Use Lagrange's method of multipliers, find the volume of largest rectangular parallelepiped that can be inscribed in the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$. **(3 + 4 + 5)**

Q4. (a) Change the order of integration and hence evaluate $\int_0^\infty \int_0^x e^{-xy} y \, dy dx$.

(b) Evaluate $\int\int\int_V \sqrt{1 - \frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{z^2}{c^2}} \, dx dy dz$, where $V = \left\{(x, y, z) : \frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} \leq 1\right\}$.

(c) Find by double integration, the area lying inside the circle $r = a \sin\theta$ and outside the cardioid $r = a(1 - \cos\theta)$.

(d) Evaluate $\int\int\int \frac{z^2}{x^2 + y^2 + z^2} dx dy dz$ over the volume of the sphere $x^2 + y^2 + z^2 = 2$.
(4 + 4 + 4 + 5)

Q5. (a) State Stoke's theorem.

(b) Find the value of $\nabla(\nabla \cdot \vec{A})$, where $\vec{A} = \frac{\vec{r}}{r}$ and $\nabla(logr)$.

(c) Find the directional derivative of $f = x^2yz + 4xz^2$ at $(1, -2, -1)$ in the direction of $2\hat{i} - \hat{j} - 2\hat{k}$.

(d) State Green theorem and hence evaluate $\int e^{-x}(\sin y \, dx + \cos y \, dy)$ where C is the rectangle with vertices $(0, 0), (\pi, 0), (\pi, \frac{\pi}{2})$ and $(0, \frac{\pi}{2})$.

(e) Verify the Gauss divergence theorem for $\vec{F} = x\hat{i} + y\hat{j} + z^2\hat{k}$ over the cylindrical region bounded by $x^2 + y^2 = 9$, $z = 0$ and $z = 2$.
(1 + 2 + 2 + 4 + 5)

NATIONAL INSTITUTE OF TECHNOLOGY- HAMIRPUR (H.P)

Centre for Energy and Environmental Engineering

Mid Semester Examination-September 2016

Branch and Class : B Tech – ECE(4 yrs) **Semester: 1st**

Subject: Basic Environmental Science & Engineering **Time: 1 Hr. 30 minutes**

Subject Code: ECS-113 **Full Marks: 20**

Attempt all the questions

Q1. Multiple choice questions (10 X 1= 10)

A. Maximum permissible noise level for residential area is

(i)30 dB (ii) 55 dB (iii) 45 dB (iv) 70 dB

B. Solid waste management is best conducted by

(i)Incineration (ii) Sanitary land fill (iii) Dumping into sea (iv) Open dumping

C. Soiled waste is in biomedical waste category number

(i) 5 (ii) 6 (iii) 7 (iv) 8

D. The Environment (protection) Act was enacted in

(i) 1986 (ii) 1878 (iii) 2010 (iv) 1998

E. Which is not a hazardous waste characteristic?

(i) Toxicity (ii) Ignitibility (iii) Reactivity (iv)Salinity

F. Maximum permissible concentration level of Arsenic as hazardous waste is

(i)5 mg/L (ii) 50 mg/L (iii) 0.02 mg/L (iv) 0.5 mg/L

G. PAN is

(i). Secondary air pollutant (ii) Primary air pollutant (iii) Criteria pollutant (iv) none of these

H. Acoustic lining is used to

(i) control particulate matter (ii) water treatment (iii) control noise pollution
(iv) none of the above

I. Among all types of healthcare waste almost _____ are infectious

(i) 5% (ii) 18% (iii) 10% (iv) 85%

J. Cyclone separator can remove particulate matter

(i) 10-50 μm particle size (ii) 0.1-10 μm particle size
(iii) less than 10 μm particle size (iv) less than 0.1μm particle size

Q2. How you can categorize hazardous wastes? Discuss about the difference between various hazardous waste management techniques? (2+3=5)

Q3. What are the e-wastes? What are the main Constituents which are known as e-toxic? How Air pollution can be controlled? (1+1+3=5)

6451

National Institute of Technology Hamirpur (HP)
Name of Examination:Mid-Semester ,B.Tech -2016

Branch : Electronics & Communication Engineering.
Course Name : Basic Electronics Engineering
Semester : 1st
Course Code : ECD-114

Time : 1.5 Hours Max Marks : 20

Note: 1.The question paper comprises of 6 questions.
2. Do write your name and roll number on paper
3. All questions are compulsory.
4. Symbols are having usual meanings.
5. Assume necessary data if necessary.

Q.1 State law of mass action and write down Einstein's relationship for a semiconductor. (2)

Q.2 Define the terms Drift velocity, mobility and Conductivity. Derive the expression of conductivity for intrinsic semiconductor. (4)

Q.3 What is tunnel diode? Explain it tunneling effect by it V-I characteristic. (4)

Q.4 A cylindrical piece of silicon having a diameter of 1mm is doped with $10^{20}/m^3$ atoms of phosphorus which is fully ionized. What length of this silicon would be required to give a resistance of 1kΩ , if electronic mobility in silicon is $0.1m^2/v-s$. (2)

OR

Compare half wave rectifier, full wave center tape rectifier and full wave bridge rectifier in term of : (1) Number of diodes (2) Maximum efficiency (3) output DC voltage (4) ripple factor (5) PIV (6) output frequency (7) Transformer Utilization Factor (8) Form Factor (4)

Q.5 What is clipper circuit. Explain all type of circuit with circuit diagram.

OR

Derive Continuity equation.

Q.6 What is clamper circuit. Explain with circuit diagram. (4)

OR

A 230V, 60 Hz voltage is applied to the primary of a 5:1 stepdown, center tapped transformer used in full wave rectifier having a load of 900Ω. If the diode resistance and secondary coil together has a resistance of 100 Ω. Determine:

(a) DC voltage across the load (b) DC current flowing through the load (c) DC power delivered to the load (d) PIV across each diode. (e) Ripple voltage and its frequency.

Name: Ashu

Roll No: 16457

National Institute of Technology Hamirpur (HP)

Name of Examination: End-Semester Examination, B.Tech- Nov. / Dec., 2016

Branch : Electronics & Communication Engineering.
Course Name : Basic Electronics Engineering
Semester : 1st
Course Code : ECD-114

Time : 3 Hours

Max Marks : 60

Note: 1.The question paper comprises of 6 questions.
2. Do write your name and roll number on paper
3. All questions are compulsory.
4. Symbols are having usual meanings.
5. Assume necessary data if necessary.

Q.1 (a) Justyfy, "Semiconductor has negative resistance coefficent and conductor has posivetive resistance coefficent". (1)

(b) What is diffusion current? Write the expression between diffusion constant? (2)

(c) Explain different junction capacitance of diode. (3)

(d) Explain the working of Varactor diode with diagram. (4)

OR

Calculate forward current in Ge diode at 20^0C when forward voltage is 0.3V. Compare this value with that after a temprature rise of 50^0C. Assume that reverse saturation current doubles for every 10^0C rise temprature.

Q.2 (a) Justyfy, "Full wave Bridge rectifire is more advantagious than Full wave centare tapped rectifier" (2)

(b) Explain the working of full wave bridge rectifier with diagram and derive the value of various performance parameters. (4)

(c) Explain the working of different type of filters used in rectifire cirucit in detail. (4)

Q.3 (a) Justyfy, "Self Bias term in Self Bias circuit". (1)

(b) Define the stability factor in transistor biasing and derive the general expression for stability. (2)

(c) Explain leakge current in common base and coomon emmiter configuration of transistor. (3)

(d) Explain input-output characteristics of common emmiter transistor configuration with base width modulation effect. (4)

OR

Derive current gain, voltage gain, input resistance and power gain in transistor amplifier using h-parameters.

Q.4 (a) Justyfy, "FET is more advantagious than BJT". (1)

(b) Explain the drain and transfer characteristic of JFET in detail. (4)

(c) Explain the working and characteristics of Depletion and Enhancement type MOSFET in detail. (5)

Q.5 (a) Derive the expession input resistance and output resistance for :

(i) voltage series feedback amplifier (ii) voltage shunt feedback amplifier (iii) current series feedback (iv) current shunt feedback. (5)

OR

Explain the working of Wien Bridge oscillator in detail and also derive frequency of oscillation and condition for sustain oscillation.

(b) Explain the working of Hartley oscillator in detail and also derive frequency of oscillation and condition for sustain oscillation. (5)

OR

Explain the working of RC phase shift oscillator in detail and also derive frequency of oscillation and condition for sustain oscillation.

Q.6 (a) Write all the characteristics of ideal operational amplifier. (2)

(b) Design differentiator using operational amplifier. (2)

(c) Design integrator using amplifier. (2)

(d) What is the significance of CMRR and and SR in the op-amp? (2)

(e) Design invering and noninverting amplifier using closed loop op-amp configuration. (2)

National Institute of Technology Hamirpur, Department of Physics

End Semester Exam. Nov./Dec. 2016

year Semester: 1st Class: ECE, B. Tech. 1st

Subject: Physics for Electronics Engineering Roll No. :..1645.....

Time: 3hrs Code: ECS-112

Note: All questions are compulsory; attempt all parts of a question together. MM: 60

Q.1 (a) Discuss various processes of interaction of radiation with matter. Obtain relationship between Einstein's coefficients. Write their significance. (4)

(b) Discuss construction and working of Ruby laser. Mention its important applications. (4)

(c)Discuss spatial and temporal coherence. Calculate ratio of spontaneous to stimulated emissions by an incandescent lamp at 2000K (in optical region $\upsilon=6\times10^{14}$Hz, Boltzmann constant $k=1.38\times10^{-23}JK^{-1}$). (4)

Q.2 (a) Discuss the accomplishments of BCS theory. (4)

(b) Discuss various dispersion losses in optical fibres. How these can be minimized? What is transparent window? (4)

(c) Write a note on SQUID's. RF/PC

OR

Explain working of photodiode. Explain its responsivity and quantum efficiency. (4)

Q.3 (a) Discuss the terms: crystalline solids, single crystal, polycrystalline material, liquid crystal, Bravais lattices, crystal structure, whiskers. (1/2+1/2+1/2+1/2+1/2+1/2+1/2+1)

OR

What is Bragg's law? Obtain Bragg's equation and explain Bragg's condition. Why lattice parameter is determined from the highest Bragg angle? (4)

(b) Draw (110) and $(\bar{1}\bar{1}1)$ plane inside cubic unit cell and determine the Miller Indices of direction that is common to both. (4)

Q.4 (a) Determine the planar density of (111) plane for SC, BCC and FCC systems. (4)

(b) How characteristic and continuous x-rays are produced? Why we prefer to use K_α radiation for crystal structure determination. (4)

Q.5 (a) Discuss the concept of degeneracy. Derive expression for density of states and Fermi energy. (6)

(b) Discuss the variation of intrinsic conductivity with temperature. How we can determine the band gap of a semiconductor? (4)

Q. 6 (a) Discuss Langevin's theory of diamagnetism. Obtain the expression for diamagnetic susceptibility and discuss the result. (6)

(b)Discuss the variation of polarization with frequency. What are the pyroelectric materials?(3+1)

National Institute of Technology, Hamirpur

Mid-Term Examination, February- 2017, 2nd Semester, Communication Skills

CSE (Dual) and IIIT Una , Course Code- CSH-123

Maximum Marks: 20 Time Allowed: 1 hr 30 mns

All questions are Compulsory.

Q1. What do you mean by Communication? Have you experienced any communication barrier in understanding the message? How can we eliminate communication barriers, so that we can work and understand better?

Q2. You are Amit Awasthi. You want to apply for the post of Project Manager at Microsoft Technologies. Draft a persuasive solicited resume.

Q3. We are a reputed IT company looking for software professionals for our development centre at Mumbai. As a Software Engineer you must have 1 to 4 years of experience in IT organizations. MCA/Engineering graduates with exposure to design, development, and testing will be preferred. Proven expertise in any of the following is essential:

Web Technologies

Java, JSP, Web services, SOAP, CORBA, XML, Websphere.

Multimedia

Photoshop, Illustrator, Flash, 3D Max, Dreamweaver, HTML.

(3*5=15)

Do As Directed.

Q4. Use the words carte blanche and faux pas in sentences to put forth their meanings.

Q5. Aayush participated in training programme. (Change into Past Perfect).

Q6. Transcribe the words phonetically: But and Pride.

Q7. You have to attend a meeting where you have to present a proposal but you are disturbed because your sister is very sick. (Identify the communication barrier).

Q8. There should be no reservation in jobs. (Strong opinion supporting the point of view.

(5*1=5)

Roll No. 17M1542

National Institute of Technology, Hamirpur (HP)

End Semester Examination, May 2018

Communication Skills (CSH-123)

B Tech, Dual Degree I Year Computer Science Engineering

Maximum Marks: 60 Time Allotted: 3:00 hours

Note: All questions carry equal marks. Attempt all the questions.

1. Compare your dream organization with another organization and state how the former has an edge over the latter. How would you map your strengths with the opportunities that your dream organization offers?

2. "A leader must be a good communicator, a good manager and a good motivator." Elaborate.

3. "Access to internet is killing creativity." Comment.

4. What will happen if you do not analyze your audience before giving a presentation?

5. Throw light on the various types of negotiation.

6. Apply with a resume for the position of a software engineer. Invent the necessary details.

7. Draft agenda and minutes for a meeting held before organizing NIMBUS in your college.

8. As a team leader, you have witnessed that the team under your supervision is not working up to the mark. Issue a memorandum pertaining to improving their work performance.

9. In which contexts would you use the following foreign expressions and idioms?
   i) Alumnus
   ii) Alfresco
   iii) In the heat of the moment
   iv) Beat around the bush
   v) Status quo
   vi) in absentia

10. Do as directed:
   A) Use "better" as a verb in a sentence.
   B) Make a sentence using "fast" as an adverb.
   C) Find out the common errors in the following sentences and correct them:
   i) I am writting this letter to inform you about the current state of affairs.
   ii) I cannot cope up with this pressure.
   iii) I did not took the test last week.
   iv) The book comprises of four chapters.

Roll No. .....

NATIONAL INSTITUTE OF TECHNOLOGY, HAMIRPUR (H.P.)

Mid Semester Examination, February 2018

Communication Skills CSH-123

B Tech II Semester CSE Dual Degree

Time 1:30 hrs **Maximum Marks: 20**

Note: Attempt all the questions.

1. What would you answer if an interviewer asks you to introduce yourself in five words? 2
2. How would you handle difficult callers? 2
3. Using at least six new words that you learnt in this semester, narrate an incident from your life. 3
4. The effectiveness of communication can be marred by the receiver of the message. Discuss. 3
5. How would you make use of non-verbal communication in a Group Discussion? 3
6. Write an opening paragraph for an unsolicited cover letter. 3
7. As non-native speakers of English what difficulties do we face in learning the language? How can we overcome such problems? 4

Roll No.: 181055

National Institute of Technology, Hamirpur

End-Term Examination – December 2018

Branch: Civil Engineering **Year:** 1st **Semester:** 1

Course Name: Communication Skills **Course Code:** CEH-113

Marks: 60 **Time:** 3 Hours

Note: All Questions are Compulsory.

Q.1: Objective Type **(10*1 = 10 Marks)**

a) Religion and politics should not be mixed. (Respond to the opinion by agreeing or disagreeing. Justify your point of view).
b) Use the homophones Feat/Feet and Break/Brake in sentences.
c) Use the suitable preposition: Hold on a minute. (in/on).
d) Use the following words in sentences: Vox Populi, Aficionado.
e) Name the various formats of Report Writing.
f) One who is able to make an eloquent speech (Write one word).
g) I would like to study in abroad. (Correct the sentence).
h) Change into Passive Voice: This pot contains milk.
i) ....days rest is all that I need. (few, the few, a few).
j) Suppose you are facing an interview panel. Write a probable answer to the question why do you want to join our company?

Short Answer Type (Q.2 to Q.9) **(8*5 = 40 Marks)**

Q.2: As a student secretary, write a report to your faculty coordinator briefing him about the annual cultural festival, *Hill Fair 2018*, recently held in your college.

Q.3: Transcribe the following words phonetically: **Hide, Poor, Pleasure, Go, Hurt.**

Q.4: Explain the nature and importance of Group Discussion. Discuss the qualities that are assessed in a Group Discussion.

Q.5: Assume that you are Rohit Rana. You completed your B. Tech in Civil Engineering from IIT Kanpur in July 2007. Since then you have been working as an Assistant Project Manager (Civil) at Petro Projects and Marketing Ltd, Golf Street, Kolkata. You wish to apply for the post of Project Leader at SK Engineering, Gurugram. Draft a persuasive solicited letter of application.

Q.6: Use the following idioms in sentences: **Abide by, Hand in Glove, Icing on the Cake, In Limbo, Leaps and Bounds.**

Q.7: Explain the term meeting. Discuss the duties and powers of the Chairperson of a meeting.

Q.8: Write short notes on the following:

a) Audience Analysis while preparing Oral Presentation
b) Self Analysis as a Pre-Interview preparation technique.

========== P.T.O. ==========

Roll No.: _____

Q.9: Read the following passage and make notes:

Coal is a natural resource, which constitutes approximately 85 percent of the total fossil fuel reserves in the world. The coal deposits of India occur in two distinct stratigraphic horizons- Gondwana and the Territories. Gondwana coal contributes about 99 per cent of the country's coal resources. These mines are located in peninsular India, in the South Eastern quadrant, bound by the 78*E longitude and the 24*N latitude, thus, leaving a major part of the country devoid of any coal deposits. The major Gondwana coalfields are represented by isolated basins, which occur along prominent present day rivers such as Damodar, Koel, Sone, Mahanadi, PenchKanhan, Pranhita and Godavari. The relatively minor resource of tertiary coal is located on the either extremities of peninsular India.

Coal can be broadly classified in two categories-coking and non-coking. Coking coal are that which has caking property and which is used in metallurgical industries. Again depending on the quality of coke produced by this coal, it is sub-divided into prime coking coal, medium coking coal, and semi coking coal. Similarly, non-coking coal is also categorized in seven grades (Grade A to G), depending on its caloric value.

Q.10: Journey is more important than the destination. Comment on the statement and illustrate it with the help of suitable examples. **(10 Marks)**

========== **END** ==========

National Institute of Technology, Hamirpur (HP)

Name of the Examination: B. Tech.
March 2017
Branch : CSE Second Semester

Course Name: Communication Skills — Course Code :CSH 124

Time: 90 minutes — Maximum Marks: 20

Note: Attempt all the questions

1. Oral communication is more advantageous than the written communication as you can clarify your point after observing the response of the receiver. Discuss. (5)

2. Discuss two personal weaknesses that you have in your personality and how would you handle these. (5)

3 "The key to increasing upward mobility is expanding vocabulary." Discuss. (5)

4 Make meaningful sentences of the following words:

1. Empathetic
2. Destiny
3. Weakness
4. Accuracy
5. Passive (5)