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# BHEL(ET) PREVIOUS EXAM PAPER for Electronics

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This previous paper is totally based on candidate's experience.

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The entire test paper consisted of 240 questions with 5 options for each question and -1/5 marks for wrong answer with 1 mark for right answer.

The paper consisted of primarily **four sections**

**1) Technical Engg (60 Questions)**

**2) Basic Engg (60 Questions)**

**3) Verbal Ability (60 Questions)**

**4) Quantitative (60 Questions)**

**A) Technical Engineering (Electronics)**

1) Sampling theorem is used in what? (AM, FM, PCM, AM & FM)

2) What is the bandgap of germanium?

3) Which of the following elements is used for making P-type semiconductor material from intrinsic semiconductor? (Phosphorous, Boron, Gallium, Gallium Arsenide)

4) Question on the power of the SSB signal of AM wrt to given modulation index.

5) Modulation Index of AM, FM, PM

6) Question on the values of damping factor for critically damped, underdamped, overdamped systems.

7) Which of the following modes do not exist in wave guides? (TE<sub>1</sub>, TM<sub>1</sub>, TEM<sub>1</sub>,)

- 8) What is the band used to send the AM signals (HF, VHF, SHF, UHF)
- 9) Which of the following waves have maximum frequency? (X-Rays, UV rays, Radio waves, Infrared waves)
- 10) What is the metal where X-Rays cannot penetrate into? (Copper, lead, Tungsten)

B) Basic Engineering (Most of the questions were from 12th class physics, chemistry)

- 1) Questions on the friction.
  - 2) Which type of steel is used in railway line among carbonsteel, mild steel?
  - 3) Questions on specific gravity.
  - 4) What is the optimum humidity to be provided by a Air Conditioner?
  - 5) What is the weight of 1 cubic meter air?
  - 6) Questions on centripital force.
  - 7) Questions on pendulum.
- C) Verbal Ability
- 1) 10 Questions on spell check
  - 2) 6 questions on comprehension paragraph
  - 3) 10 questions on sentence correction
  - 4) 10 questions to check whether the two statements given are inplict, explicit or imply each other.
  - 5) Questions relating to relationships.

D) Quant Ability

- 1) 20 questions on match the following (very easy ones)?

2) Average proportions based questions

3) Work completed by 10 people in 5 days then 20 people will complete in how many days?

4) Age related questions.

1) Barkhausen criterion of oscillation is

2) Class B amplifier has less efficiency compared to

3) Which of the following can be used to determine beta B

4) A current controlled current source is – input resistance and – output resistance

5) Which is most stable oscillator → crystal oscillator

6) Formula of RC phase shift oscillator

7) Forbidden gap of germanium

8) 6 diodes are connected in series with 6V each then breakdown voltage will have

9) Which will have least distortion → phase distortion

10) Which of the following the intrinsic semiconductor Si is doped to obtain p type semiconductor?

11) In metal conductivity is?

12) Speech amplifier is of which class type of amplifier?

13) Which of the following is not specified for digital logic family → bandwidth

14) Mod 6 counter requires how many states

15) Which logic family is work in non saturated mode?

16) Simple question on control like steady state response, delta function its Laplace transform

17) Answer with infinity value indicates?

18) Which wave guide doesn't exist? → TEM

19) Question on Maxwell question?

20) Frequencies in UV range are propagated by means of?

21) Given the values of modulation index  $m_1$  and  $m_2$  find overall efficiency?

22) In Bode plot  $\omega_2/\omega_1$  decade indicates?

23) Basic question in aptitude sufficient R.S Aggarwal see Rank sequence, Blood relation, odd term out,

statement conclusion, complete sentences, problem on ages, direction problems,

24) Last 20 question on comparison refer barron book or see it's PDF in net.

1) Why Mn is added in steel.

2) Purest form of iron.

3) Rail uses which type of steel.

4) Which of the metals is the poorest conductor of electricity(copper,silver etc.)

5) Laplace transform of a dirac delta function.

6) LVDT measures-

7) Enhancement mode occurs in which device(Jfet,bjt,mosfet,UJT)

8) Polyethene has what type of structure

9) Which of the materials is made of silica(glass,diamond)

10) Which of the materials has the least hardness(diamond,quartz,talc)

11) Which amplifier has more efficiency than class b amplifier

12) Space waves belong to which frequency range(vhf,uhf)

13) Permissible humidity in an air conditioned room

14) If  $S/N=43.25$  db,no of levels

15) In radio receivers,Maximum image signal selectivity provided in which state-rf amplifier,i.f.amplifier,audio amplifier,frequency mixer.

16) One of the following cannot be used to demodulate ssb-product detector,diode balanced modulator,bipolar transistor balanced modulator,complete phase shift generator.

17) Which of the following is not maxwell's equation-(a) $b=uh$  (b) $E=D/e$  (c) $E=ed$

18) VSWR

- 19) Sampling theorem is used in -fm,am,pcm
- 20) How many bits are used to address 64k memory location-3,10,16,32
- 21) Which of the foll flip flops is used as a latch-ttl,ecl,cmos,lsi
- 22) The sum s of a and b in a half adder can be implemented by using k nand gates.the value of k is -3,4,5,none of these
- 23) The most widely used bipolar technology for digital ic's is-dtl,ttl,ecl
- 24) Class b amplifiers has less efficiency compared to -class A,class AB,class C,class A,AB and C
- 25) Which of the following is the most stable oscillator-wein bridge oscillator,hartley oscillator,colpitts oscillator.
- 26) In case of rc phase shift oscillator,the frequency of oscillations is given by- $1/(2TT*6^{1/2}*RC)$ , $1/(2TTR*C^{1/2})$ , $2TT/(RC)^{1/2}$ , $2TT*(RC)^{1/2}$
- 27) Barkhausen criterion for oscillator frequency is - $AB=0$ , $AB=1$ , $AB=-1$ .
- 28) The standard if value for am receivers is-455khz,455 mhz,107 khz,10.7 mhz
- 29) In a radio receiver the noise is generally increased by -mixer,local oscillator,power amplifier,power supply.
- 30) During the day time,ionosphere composes of -d,e,f2 layer;d,f1,f2 layer;d,e,f1,f2 layer.
- 31) When the modulating frequency is doubled,the modulation index is halved and the modulating voltage remains constant.the modulation system is-am,fm,pm,any one of them.
- 32) Octave frequency range is specified by -  $w2/w1=2$ , $w2/w1=10$ , $w2/w1=8$ .
- 33) The gain margin is the reciprocal of the gain at the frequency at which the phase becomes-0,90,180,270.
- 34) The foll system is generally preferred-overdamped,critically damped,underdamped,oscillatory.
- 33) The response of a control system having damping factor as unity will be- oscillatory,undamped,critically damped,none of the above.
- 34) The foll. compensator is used to increase the damping of a heavily under damped system-phase lag, phase lead,phase lag lead, none of these.

35) In the characteristic eqn.  $1+k/\{s(s+1)(s+2)\}=0$ , the centroid of the asymptotes is given by -1, -1, 2, -2

36) Depth of modulation.

37) 3 zener diodes having the breakdown voltage 6 v in series, resultant voltage-6 V, 18 V.

38) Fermi level in ge-0.67, 1.2ev

39) which of the following plot can be directly used to determine B-Vce versus Ic for constant Ib, Vbe versus Ib for constant Vce, Vcb versus Ic for constant Ie.

40) A DVM measures-peak value, r.m.s. value, peak to peak value, average value.

41) An ideal current controlled voltage source has-  
 $R_i = \infty, R_o = \infty; R_i = 0, R_o = \infty; R_i = 0, R_o = 0; R_i = \infty, R_o = 0$ .

42) Rotameter used to measure-flow, rotations

43) Diff between true value and indicated value-static error, dynamic error, absolute error

44) No of 2:1 mux needed for 4:1 mux-2, 3, 4.

45) red+green-black, violet.

46) Superconductivity means conductivity-infinite, 0.

47) Frequency of TE<sub>11</sub> wave.

48) Process is irreversible if efficiency->50%, <50%.

1) Very simple questions

1n type which material is used?

2) Ground wave , sky wave, space wave range of frequency?

3) pcm s/n ratio ?

4) Quantisation level in pcm?

5) 3 zener diodes r conected in series wwith a power supply of 24 volts , what is break down vottage voltage of each diode?

6) Am equation, pwer caluculation 3 questions?

- 7) fm modulating index one problem  $\beta = \Delta f / f_m$
- 8) Doping one problem?
- 9) Ivdv application?
- 10) How many 2:1 mux required to construct exor and nand gate?
- 11) Sign magnitude addition 1 problem?
- 12) Address bus width of 64k?
- 13) 8085 addresss bus width?
- 14) Maxwell equations 1 question?
- 15) Group velocity one question?
- 16) laplce transforms 2 questions?
- 17) Conrol system stability 2 questions on root locus

Section2: 60 questions general engineering (which contains material science, mechanics, intermediate physics)

- 1) Water density is max at what temp?
- 2) Rail strips r manufactured with this alloy?
- 3) Entroy,specific heat ,centre of gravity some questions ?

I don't remember exactly this section because i am very knew to this section?

Setion3 40 englisgh, 40 aptitude, 40 reasoning

Aptitude

- 1) Calender 1 question?
- 2) Ages 4 question?
- 3) Relations 4 questions?
- 4) Synonyms 5 questions?
- 5) Sentence correctoin 5 questions
- 6) Passage 5 questions
- 7) Directions 4 questions?
- 8) 5 correct pronounciations of words?
- 9) a  $a < 1$   $1/a$   
a a is greater  
b  $1/a$  is greater

- c both are equal
- d not concluded based on given data

This type of questions are 15, you can find this questions in barron gre book

\* 10 logical conclusions 10

All boys are engineers  
Some are doctors  
Some are lawyers

You can find this type of questions in R.S Aggarwal reasoning book after exam i felt that

\* Section 1 is very easy  
Any gate material is sufficient

\* Section3

Read R.S Aggarwal reasoning,  
R.S Aggarwal aptitude  
Gre barrons book

1) A compensating coil in wattmeter helps in providing

(a) decrease impedance in current coil (b) decrease in impedance in pressure coil (c) voltage drop in pressure coil two more options are there i think answer should be (d) please check.

2) Which of the following is transfer type ac-dc (1) electrostatic (2) electrodynamic and so on (b) is right answer.

3) When three phase unbalanced supply system in transmission system then

Ans: Only negative sequence fault exist

4) Then ask about Maxwell bridge

Ans: L is in series with R

5) Laplace transform of  $\sin(q)$  is

Ans:  $w/(s^2+w^2)$

impulse response of  $1/(s+1)(s+2)$

6) Two very simple questions on thevenin where two resistor connected in parallel and a voltage source and across one of the resistor find out  $V_{th}$  and  $R_{th}$

7) Then ask about network topology where a node is connected with three branches and two branches have current 5A and 10A find out third branch current.

8) Some portion of simple mathematics ask like find out eigen value where given a matrix  $\begin{bmatrix} 5 & 3 \\ 3 & -3 \end{bmatrix}$

Ans is (6,4)

$\begin{bmatrix} 3 & -3 \end{bmatrix}$

Also ask about maxima  $f(x) = x - 0.5x^2$  ans is 0.5

9) What is phase cross over frequency of  $k/s(s+1)(s+2)$

10) Sumpner's test in transformer is for detecting no load losses.

11) House hols fan has which type of motor ans is capacitor start and run induction motor.

Friends several questions are numerical based that i never attempted as time is not more to understand and solve

120 questions from technical and 120 from aptitude were asked.

In aptitude 1,3,6,10,15 what is 21st term

Some questions so much difficult some very easy but it requires speed try to catch easy questions and solve within seconds.

Verbal reasoning they asked about statement conclusion, spell check, logic reasoning like tree: Trunk then pen: ink and

Venn diagram for e.g.

1) Men, parents, mother

2) Atmosphere, gases, nitrogen

Here you have to find relation between them and which venn diagram suitable for it will be the option.

In english passage, spotting the error, antonyms

Section-2(Quants&Reasng-85,English-35, Total-120)

1. Problems in Geometry and Mensuration(10-15qns)

2. SI, CI and Shares(3qns)

3. Time Distance(2qns)

4. Ratio and Proportion(4qns)

5. Venn diag (1+1+2Qns)

6. Mixtures and Alligations (2qns)

7. Clock and Calendar (2qns)

8. Time cistern and Work (3qnsP)

9. Time and Distance (2qns)

10. Arithmetic Calc-square roots, cubes, etc (2qns)

11.Age (1qn)

12. Coding and Decoding

13. Analogy, direction, Blood Relations

14. GMAT model qns-(25 qns)

Col-A	Col-B
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5X8	6X7
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a) col A > col B (b) col A < col B (c) col A = col B (d) no Relation (e) Answer not in option

15. Comprehension Reading-1(5qns)

16. Antonyms& Synonyms (5+5)

17. Spelling Mistake (5qns)

18. Sentence correction (5qns)

19. Jumbled Paragraph formation (5qns)

20. Fill in the Blanks (5qns)

For reasoning Verbal and Non verbal reasoning by R. S. Aggarwal is more than sufficient. For aptitude R. S Aggarwal is not sufficient. Learn more easy solving methods, Shortcuts-Refer TIME material.

Time is the main constraint-2.5hrs (240qns)...Multiple choice(5 options)...1/5 negative mark.. Concentrate more on section-2.....

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